

# **GAP**

Release 4.4.2  
18 March 2004

# **Index**

The GAP Group

<http://www.gap-system.org>

# Full Index

This index covers the five main books of the GAP manual, pages are given with respect to each manual: **Ref**, **Tut**, **Prg**, **New**, and **Ext**. A page number in *italics* refers to a whole section which is devoted to the indexed subject. Keywords are sorted with case and spaces ignored, e.g., “PermutationCharacter” comes before “permutation group”.

(Near-)Additive Magma Categories, *R 546*  
(Near-)Additive Magma Generation, *R 547*  
+, *R 47*  
-, *R 47*  
-A, *R 29*  
-B, *R 30*  
-C, *R 30*  
-D, *R 30*  
-K, *R 28*  
-L, *R 29*  
-M, *R 30*  
-N, *R 30*  
-O, *R 30*  
-P, *R 30*  
    on Macintosh, *R 31*  
-R, *R 29*  
-T, *R 30*  
-U, *R 30*  
-W, *R 30*  
    on Macintosh, *R 31*  
-X, *R 30*  
-Y, *R 30*  
-a, *R 29*  
    on Macintosh, *R 31*  
-b, *R 27*  
-e, *R 27*  
    on Macintosh, *R 31*  
-f, *R 27*  
    on Macintosh, *R 31*  
-g, *R 28*  
-g -g, *R 28*  
-h, *R 27*  
-i, *R 30*  
-l, *R 28*  
-m, *R 28*  
-n, *R 27*  
    on Macintosh, *R 31*  
-o, *R 28*  
    on Macintosh, *R 31*  
-q, *R 27*  
-r, *R 29*  
-x, *R 27*  
-y, *R 28*  
-z, *R 30*  
    on Macintosh, *R 31*  
. , *E 16*  
.gaprc, *R 33*  
/, *R 47*  
    for character tables, *R 717*  
%, *E 24*  
%display, *E 25*  
%enddisplay, *E 25*  
\*, *R 47*  
    for character tables, *R 717*  
\', *R 244*  
\., *E 16*  
\>, *E 16*  
\Appendices, *E 13*  
\BeginningOfBook, *E 12*  
\Bibliography, *E 13*  
\C, *E 20*  
\Chapter, *E 14*  
\Chapters, *E 13*  
\Colophon, *E 11*  
\Day, *E 14*  
\Declaration, *E 27*  
\EndOfBook, *E 11*  
\F, *E 20*  
\FileHeader, *E 27*  
\FrontMatter, *E 12*  
\Index, *E 13*  
\Mailto, *E 16*  
\Month, *E 14*  
\N, *E 20*

- `\OneColumnTableOfContents`, E 12
  - `\Package`, E 12
  - `\PseudoInput`, E 14
  - `\Q`, E 20
  - `\R`, E 20
  - `\Section`, E 14
  - `\TableOfContents`, E 12
  - `\TitlePage`, E 11
  - `\Today`, E 14
  - `\URL`, E 16
  - `\UseGapDocReferences`, E 12
  - `\UseReferences`, E 11
  - `\XYZ`, R 244
  - `\Year`, E 14
  - `\Z`, E 20
  - `\"`, R 244
  - `\,`, R 244
  - `\accent127`, E 16
  - `\atindex`, E 16
  - `\b`, R 244
  - `\beginexample`, E 22
    - indicating unstable output, E 22
  - `\beginitems`, E 20
  - `\beginlist`, E 21
  - `\begintt`, E 22
  - `\c`, R 244
  - `\calR`, E 20
  - `\endexample`, E 22
  - `\enditems`, E 20
  - `\endlist`, E 21
  - `\endtt`, E 22
  - `\fmark`, E 16
  - `\in`, operation for testing membership, R 268
  - `\index`, E 16
  - `\indextt`, E 16
  - `\item`, E 21
  - `\itemitem`, E 21
  - `\kernttindent`, E 16
  - `\lq`, E 16
  - `\matrix`, E 23
  - `\n`, R 244
  - `\nolabel`, use in index and label suppression, E 15
  - `\null`, use in index suppression, E 15
  - `\package`, E 16
  - `\pif`, E 16
  - `\r`, R 244
  - `\rq`, E 16
  - `ˆ`, R 47
    - for class functions, R 755
  - 1-Cohomology, R 370
  - 2-Cohomology and Extensions, R 448
- ## A
- A, Attribute mark-up, E 16
  - AbelianGroup, R 500
  - AbelianInvariants, for character tables, R 720
    - for groups, R 358
  - Abelian Invariants for Subgroups, R 468
  - AbelianInvariantsMultiplier, R 373
  - AbelianInvariantsNormalClosureFpGroup, R 468
  - AbelianInvariantsNormalClosureFpGroupRrs, R 468
  - AbelianInvariantsOfList, R 236
  - AbelianInvariantsSubgroupFpGroup, R 468
  - AbelianInvariantsSubgroupFpGroupMtc, R 468
  - AbelianInvariantsSubgroupFpGroupRrs, R 468
  - AbelianNumberField, R 577
  - abelian number field, R 578
  - abelian number fields, canonicalbasis, R 580
  - abelian number fields, Galois group, R 581
  - AbelianSubfactorAction, R 395
  - About Functions, T 24
  - About Group Actions, R 387
  - AbsInt, R 126
  - AbsoluteIrreducibleModules, R 736
  - AbsoluteValue, R 155
  - absolute value of an integer, R 126
  - AbsolutIrreducibleModules, R 736
  - abstract word, R 318
  - AbstractWordTietzeWord, R 477
  - accessing, list elements, R 170
    - record elements, R 254
  - Accessing a Module, R 682
  - Accessing Record Elements, R 254
  - Accessing Subgroups via Tables of Marks, R 703
  - Accessing Weak Pointer Objects as Lists, E 52
  - Acknowledgements, T 12
  - AClosestVectorCombinationsMatFFVecFFE, R 213
  - ActingAlgebra, R 620
  - ActingDomain, R 399
  - Acting OnRight and OnLeft, R 424
  - Action, R 394
  - action, by conjugation, R 388
    - on blocks, R 388
    - on sets, R 388

- ActionHomomorphism, R 393
- Action of a group on itself, *R 395*
- Action on Subfactors Defined by a Pcgs, *R 439*
- actions, R 388
- Actions of Groups, *T 47*
- Actions of Matrix Groups, *R 421*
- ActorOfExternalSet, R 401
- Add, R 173
- add, an element to a set, R 191
- AddCoeffs, R 211
- AddGenerator, R 479
- AddGenerators, R 337
- AddGeneratorsExtendSchreierTree, R 416
- AddHashEntry, N 10
- Adding a new Attribute, *P 37*
- Adding a new Operation, *P 36*
- Adding a new Representation, *P 37*
- Adding new Concepts, *P 39*
- addition, R 47
  - list and non-list, R 181
  - matrices, R 216
  - matrix and scalar, R 216
  - operation, R 289
  - rational functions, R 656
  - scalar and matrix, R 216
  - scalar and matrix list, R 217
  - scalar and vector, R 209
  - vector and scalar, R 209
  - vectors, R 208
- Addition of a Method, *P 34*
- Additive Arithmetic for Lists, *R 180*
- AdditiveInverse, R 287
- AdditiveInverseAttr, R 287
- AdditiveInverseImmutable, R 287
- AdditiveInverseMutable, R 287
- AdditiveInverseOp, R 287
- AdditiveInverseSameMutability, R 287
- AdditiveInverseSM, R 287
- AdditiveNeutralElement, R 548
- AddRelator, R 479
- AddRowVector, R 211
- AddRule, R 337
- AddRuleReduced, R 337
- AddSet, R 191
- AdjointAssociativeAlgebra, R 637
- AdjointBasis, R 609
- AdjointMatrix, R 637
- AdjointModule, R 621
- Advanced Features of GAP, *R 29*
- Advanced List Manipulations, *R 199*
- Advanced Methods for Dixon-Schneider Calculations, *R 737*
- AffineAction, R 440
- AffineActionLayer, R 440
- AffineOperation, R 440
- AffineOperationLayer, R 440
- A First Attempt to Implement Elements of Residue Class Rings, *P 44*
- Agemo, R 356
- AgGroup, T 78
- Algebra, R 600
- AlgebraByStructureConstants, R 603
- AlgebraGeneralMappingByImages, R 614
- AlgebraHomomorphismByImages, R 614
- AlgebraHomomorphismByImagesNC, R 614
- AlgebraicExtension, R 677
- Algebraic Structure, *T 68*
- Algebras, *T 61*
- AlgebraWithOne, R 600
- AlgebraWithOneGeneralMappingByImages, R 614
- AlgebraWithOneHomomorphismByImages, R 615
- AlgebraWithOneHomomorphismByImagesNC, R 615
- AllBlocks, R 398
- AllIrreducibleSolvableGroups, R 518
- AllLibraryGroups, R 506
- AllPrimitiveGroups, R 506
- AllSmallGroups, R 509
- AllTransitiveGroups, R 506
- Alpha, R 806
- AlternatingGroup, R 500
- and, R 166
  - for filters, R 167
- An Example of Advanced Dixon-Schneider Calculations, *R 738*
- An Example of a GAP Package, *E 36*
- ANFAutomorphism, R 582
- AntiSymmetricParts, R 772
- antisymmetric relation, R 308
- Append, R 173
- AppendTo, R 94
  - for streams, R 100
- Apple, R 822
- ApplicableMethod, R 76, T 75
- ApplicableMethod, *R 76*
- Applicable Methods and Method Selection, *P 12*
- ApplicableMethodTypes, R 76

- Apply, R 194
- ApplyFunc, T 78
- ApplySimpleReflection, R 634
- ApproximateSuborbitsStabilizerPermGroup, R 415
- ARCH\_IS\_MAC, R 34
- ARCH\_IS\_UNIX, R 34
- ARCH\_IS\_WINDOWS, R 34
- arg, special function argument, R 45
- ArithmeticElementCreator, P 41
- Arithmetic for External Representations of Polynomials, R 675
- Arithmetic for Lists, R 178
- Arithmetic Issues in the Implementation of New Kinds of Lists, P 27
- Arithmetic Operations for Class Functions, R 753
- Arithmetic Operations for Elements, R 289
- Arithmetic Operations for General Mappings, R 301
- Arithmetic Operators, R 47
- Arrangements, R 145
- arrow notation for functions, R 56
- AsAlgebra, R 609
- AsAlgebraWithOne, R 610
- AsBinaryRelationOnPoints, R 309
- AsBlockMatrix, R 231
- AscendingChain, R 362
- AsDivisionRing, R 567
- AsDuplicateFreeList, R 193
- A Second Attempt to Implement Elements of Residue Class Rings, P 45
- AsField, R 567
- AsFreeLeftModule, R 564
- AsGroup, R 342
- AsGroupGeneralMappingByImages, R 376
- AsLeftIdeal, R 554
- AsLeftModule, R 562
- AsList, R 264
- AsMagma, R 313
- AsMonoid, R 534
- AsPolynomial, R 658
- AsRightIdeal, R 554
- AsRing, R 551
- AsSemigroup, R 527
- Assert, R 79
- AssertionLevel, R 79
- Assertions, R 79
- AsSet, R 264
- AssignGeneratorVariables, R 325
- assignment, T 22
  - to a list, R 171
  - to a record, R 255
  - variable, R 48
- Assignments, R 48
- AssignNiceMonomorphismAutomorphismGroup, R 383
- AssociatedPartition, R 150
- AssociatedReesMatrixSemigroupOfDClass, R 533
- Associates, R 557
- associativity, R 47
- AssocWordByLetterRep, R 330
- AsSomething, T 70
- AsSortedList, R 264
- AsSSortedList, R 264
- AsStruct, R 281
- AsSubalgebra, R 610
- AsSubalgebraWithOne, R 610
- AsSubgroup, R 343
- AsSubgroupOfWholeGroupByQuotient, R 466
- AsSubmagma, R 313
- AsSubmonoid, R 534
- AsSubsemigroup, R 527
- AsSubspace, R 585
- AsSubstruct, R 284
- AsTransformation, R 544
- AsTransformationNC, R 544
- AsTwoSidedIdeal, R 554
- AsVectorSpace, R 584
- at exit functions, R 71
- ATLAS Irrationalities, R 157
- AtlasIrrationality, R 159
- atomic irrationalities, R 157
- Attributes, R 120, T 72
- Attributes and Operations for Algebras, R 608
- Attributes and Properties for (Near-)Additive Magmas, R 548
- Attributes and Properties for Collections, R 265
- Attributes and Properties for Magmas, R 315
- Attributes and Properties for Matrix Groups, R 420
- Attributes and Properties of Character Tables, R 718
- Attributes and Properties of Elements, R 285
- Attributes of and Operations on Equivalence Relations, R 310
- Attributes of Tables of Marks, R 693
- Attributes vs. Record Components, T 80
- AttributeValueNotSet, R 121

- AugmentationIdeal, R 649
- AugmentedCosetTableInWholeGroup, R 461
- AugmentedCosetTableMtc, R 461
- AugmentedCosetTableRrs, R 461
- Augmented Coset Tables and Rewriting, *R 461*
- Authorship and Maintenance, *T 11*
- automatic loading of gap packages, R 828
- AutomorphismDomain, R 382
- AutomorphismGroup, R 382
  - for groups with pcgs, R 441
- automorphism group, of number fields, R 581
- Automorphisms and Equivalence of Character Tables, *R 745*
- AutomorphismsOfTable, R 721
- B**
- $b_N$ , R 157
- backslash character, R 244
- backspace character, R 244
- Backtrace, T 85
  - GAP3 name for Where, R 69
- Backtrack, *R 417*
- BANNER, R 833
- BaseFixedSpace, R 223
- BaseIntersectionIntMats, R 233
- BaseIntMat, R 233
- BaseMat, R 225
- BaseMatDestructive, R 225
- BaseOfGroup, N 20, R 414
- BaseOrthogonalSpaceMat, R 226
- BasePointOfSchreierTransversal, N 16
- Bases of Vector Spaces, *R 586*
- BaseStabChain, R 414
- BaseSteinitzVectors, R 226
- Basic Actions, *R 388*
- Basic Groups, *R 499*
- Basic Operations for Class Functions, *R 752*
- Basic Operations for Lists, *R 169*
- BasicWreathProductOrdering, R 277
- Basis, R 587
- BasisNC, R 587
- BasisVectors, R 588
- Bell, R 143
- Bernoulli, R 144
- BestQuoInt, R 128
- BestSplittingMatrix, R 738
- BiAlgebraModule, R 618
- BiAlgebraModuleByGenerators, R 618
- bibtex, E 26
- BilinearFormMat, R 632
- binary relation, R 307
- BinaryRelationByElements, R 307
- BinaryRelationOnPoints, R 308
- BinaryRelationOnPointsNC, R 308
- Binary Relations on Points, *R 308*
- BinaryRelationTransformation, R 545
- BindGlobal, P 31, R 44
- Binomial, R 143
- blank, R 39
- BlistList, R 204
- Block Matrices, *R 231*
- BlockMatrix, R 231
- Blocks, R 398
- BlocksInfo, R 726
- Block Systems, *R 398*
- BlownUpMat, R 228
- BlownUpVector, R 228
- BlowUpIsomorphism, R 421
- BNF, R 57
- body, R 54
- BombieriNorm, R 664
- Boolean Lists Representing Subsets, *R 204*
- bound, R 41
- Brauer character, R 759
- BrauerCharacterValue, R 782
- BrauerTable, R 712
- BrauerTableOp, R 712
- BravaisGroup, R 424
- BravaisSubgroups, R 424
- BravaisSupergroups, R 424
- Break, *R 53*
- break loop message, R 68
- Break Loops, *R 66*
- break loops, T 20
- break statement, R 53
- browsing backwards, R 22
- browsing backwards one chapter, R 22
- browsing forward, R 22
- browsing forward one chapter, R 22
- browsing the next section browsed, R 22
- browsing the previous section browsed, R 22
- Browsing through the Sections, *R 22*
- bug reports, see If Things Go Wrong, R 820
- Building new orderings, *R 273*
- buildman.pe, E 27

**C**

- C, Category mark-up, E 16
- $c_N$ , R 157
- Calculating with Group Automorphisms, R 383
- Calendar Arithmetic, R 251
- CallFuncList, R 60
- Calling a function with a list argument that is interpreted as several arguments, R 60
- Calling of and Communication with External Binaries, E 39
- Cancellation Tests for Rational Functions, R 675
- CanComputeIndex, R 374
- CanComputeIsSubset, R 374
- CanComputeSize, R 373
- CanComputeSizeAnySubgroup, R 374
- candidates, for permutation characters, R 775
- CanEasilyCompareElements, R 288
- CanEasilyCompareElementsFamily, R 288
- CanEasilyComputePcgs, R 427
- CanEasilySortElements, R 288
- CanEasilySortElementsFamily, R 288
- CanEasilyTestMembership, R 373
- CanonicalBasis, R 587
- canonical basis, for matrix spaces, R 594
  - for row spaces, R 594
- CanonicalElt, N 14
- CanonicalGenerators, R 632
- CanonicalPcElement, R 429
- CanonicalPcgs, R 432
- CanonicalPcgsByGeneratorsWithImages, R 434
- CanonicalRepresentativeDeterminatorOf-ExternalSet, R 401
- CanonicalRepresentativeOfExternalSet, R 400
- CanonicalRightCosetElement, R 347
- Carmichael's lambda function, R 134
- carriage return character, R 244
- CartanMatrix, R 632
- CartanSubalgebra, R 629
- Cartesian, R 195
- Categories, R 117
- Categories and Properties of Algebras, R 607
- Categories for Streams and the StreamsFamily, R 96
- Categories of Associative Words, R 323
- Categories of Matrices, R 215
- CategoriesOfObject, R 119
- Categories of Words and Nonassociative Words, R 318
- CategoryCollections, P 16, R 260
- CategoryFamily, P 16
- Catering for Plain Text and HTML Formats, E 25
- Center, R 316
- center, R 315
- CentralCharacter, R 762
- central character, R 762
- CentralIdempotentsOfAlgebra, R 612
- centraliser, R 315
- Centralizer, R 315
  - for groups with pcgs, R 441
- CentralizerInGLnZ, R 424
- CentralizerModulo, R 363
- CentralizerSizeLimitConsiderFunction, R 442
- CentralNormalSeriesByPcgs, R 435
- Centre, R 316
  - for groups with pcgs, R 441
- centre, of a character, R 761
- CentreOfCharacter, R 761
- CF, R 577
- ChainHomomorphicImage, N 20
- ChainStatistics, N 20
- ChainSubgroup, N 19
- ChainSubgroupByDirectProduct, N 21
- ChainSubgroupByHomomorphism, N 20
- ChainSubgroupByProjectionFunction, N 20
- ChainSubgroupByPSubgroupOfAbelian, N 21
- ChainSubgroupBySiftFunction, N 21
- ChainSubgroupByStabiliser, N 20
- ChainSubgroupByTrivialSubgroup, N 21
- ChainSubgroupQuotient, N 21
- ChangedBaseGroup, N 20
- Changed Command Line Options, T 77
- Changed Functionality, T 77
- Changed Variable Names, T 78
- Changes from Earlier Versions, T 13
- ChangeStabChain, R 416
- Changing Presentations, R 478
- Changing the Help Viewer, R 23
- Changing the Representation, R 282
- Changing the Structure, R 281, T 70
- Chapters and Sections, E 14
- CHAR.INT, R 249
- CHAR.SINT, R 250
- Character, R 757
- Character Conversion, R 249
- CharacterDegrees, R 718
- Character Degrees and Derived Length, R 806
- Characteristic, R 285

- characteristic, for class functions, R 756
- CharacteristicPolynomial, R 227
- characteristic polynomial, for field elements, R 569
- CharacterNames, R 722
- characters, R 750
  - permutation, R 775
  - symmetrizations of, R 771
- CharacterTable, R 712
- Character Table Categories, *R 713*
- CharacterTableDirectProduct, R 740
- CharacterTableFactorGroup, R 741
- CharacterTableIsoclinic, R 742
- character tables, R 711
  - access to, R 711
  - calculate, R 711
  - infix operators, R 717
  - of groups, R 711
- CharacterTableWithSortedCharacters, R 743
- CharacterTableWithSortedClasses, R 744
- CharacterTableWreathSymmetric, R 742
- character value, of group element using powering operator, R 755
- CharsFamily, R 245
- CharTable, T 78
- CheckFixedPoints, R 796
- CheckForHandlingByNiceBasis, R 599
- CheckPermChar, R 803
- ChevalleyBasis, R 631
- ChiefNormalSeriesByPcgs, R 436
- ChiefSeries, R 359
- ChiefSeriesThrough, R 359
- ChiefSeriesUnderAction, R 359
- ChineseRem, R 129
- Chinese remainder, R 129
- Chomp, R 249
- CIUnivPols, R 655
- ClassElementLattice, R 365
- classes, real, R 723
- ClassesSolvableGroup, R 441
- ClassFunction, R 757
- class function, R 750
- class function objects, R 750
- class functions, R 793
  - as ring elements, R 754
- ClassFunctionSameType, R 758
- Class Fusions between Character Tables, *R 788*
- Classical Groups, *R 501*
- ClassMultiplicationCoefficient, for character tables, R 730
- class multiplication coefficient, R 730
- ClassNames, R 722
- ClassNamesTom, R 694
- ClassOrbit, R 723
- ClassPermutation, R 744
- ClassPositionsOfAgemo, R 724
- ClassPositionsOfCentre, for characters, R 761
  - for character tables, R 724
- ClassPositionsOfDerivedSubgroup, R 724
- ClassPositionsOfDirectProduct-  
Decompositions, R 724
- ClassPositionsOfElementaryAbelianSeries,  
R 724
- ClassPositionsOfFittingSubgroup, R 724
- ClassPositionsOfKernel, R 761
- ClassPositionsOfLowerCentralSeries, R 724
- ClassPositionsOfMaximalNormalSubgroups,  
R 724
- ClassPositionsOfNormalClosure, R 724
- ClassPositionsOfNormalSubgroup, R 748
- ClassPositionsOfNormalSubgroups, R 724
- ClassPositionsOfSupersolvableResiduum, R 724
- ClassPositionsOfUpperCentralSeries, R 724
- ClassRoots, R 723
- ClassStructureCharTable, R 730
- ClassTypesTom, R 694
- CleanedTailPcElement, R 429
- ClearCacheStats, R 82
- ClearProfile, R 81
- clone, an object, R 113
- CloseMutableBasis, R 592
- CloseStream, R 97
- ClosureGroup, R 344
- ClosureGroupAddElm, R 345
- ClosureGroupCompare, R 345
- ClosureGroupDefault, R 345
- ClosureGroupIntest, R 345
- ClosureLeftModule, R 563
- ClosureNearAdditiveGroup, R 548
- Closure Operations and Other Constructors, *R 309*
- ClosureRing, R 551
- Closures of (Sub)groups, *R 344*
- ClosureSomething, T 70
- ClosureStruct, R 281
- ClosureSubgroup, R 345
- ClosureSubgroupNC, R 345

- Coboundaries, R 642
- Cochain, R 641
- CochainSpace, R 641
- Cocycles, R 642
- cocycles, R 370
- CodePcGroup, R 451
- CodePcgs, R 451
- Coding a Pc Presentation, *R 451*
- coefficient, binomial, R 143
- Coefficient List Arithmetic, *R 211*
- Coefficients, R 588
- coefficients, for cyclotomics, R 155
- CoefficientsAndMagmaElements, R 650
- CoefficientsFamily, R 672
- CoefficientsMultiadic, R 129
- CoefficientsOfLaurentPolynomial, R 664
- CoefficientsOfUnivariatePolynomial, R 658
- CoefficientsOfUnivariateRationalFunction, R 658
- CoefficientsQadic, R 129
- CoefficientsRing, R 665
- CoeffsCyc, R 155
- CoeffsMod, R 212
- cohomology, R 370
- COHORTS\_PRIMITIVE\_GROUPS, R 516
- cokernel, T 55
- CoKernelOfAdditiveGeneralMapping, R 304
- CoKernelOfMultiplicativeGeneralMapping, R 303
- CollapsedMat, R 799
- Collected, R 193
- Collection Families, *R 260*
- CollectionsFamily, P 19, R 260
- ColumnIndexOfReesMatrixSemigroupElement, R 533
- ColumnIndexOfReesZeroMatrixSemigroupElement, R 533
- Combinations, R 145
- Combinations, Arrangements and Tuples, *R 145*
- CombinatorialCollector, R 446
- Combinatorial Numbers, *R 143*
- Comm, R 289
  - for words, R 326
- Command Line Options, *R 27*
- command mark-up, E 16
- comments, R 39, T 19
- CommutativeDiagram, R 796
- CommutatorFactorGroup, R 363
- CommutatorLength, R 353
  - for character tables, R 720
- CommutatorSubgroup, R 352
- Compacted, R 193
- CompanionMat, R 228
- CompareVersionNumbers, R 830
- comparison, fp semigroup elements, R 539
  - operation, R 288
  - rational functions, R 656
- Comparison of Associative Words, *R 326*
- Comparison of Class Functions, *R 753*
- Comparison of Elements of Finitely Presented Groups, *R 454*
- Comparison of Elements of Finitely Presented Semigroups, *R 539*
- Comparison of Permutations, *R 403*
- Comparison of Rational Functions, *R 656*
- Comparison of Words, *R 319*
- Comparison Operations for Elements, *R 288*
- Comparisons, *R 46*
  - of booleans, R 165
  - of lists, R 177
- Comparisons of Booleans, *R 165*
- Comparisons of Cyclotomics, *R 157*
- Comparisons of Lists, *R 177*
- Comparisons of Records, *R 257*
- Comparisons of Strings, *R 246*
- Compatibility Mode, *T 86*
- Compatibility of Residue Class Rings with Prime Fields, *P 55*
- CompatibleConjugacyClasses, R 716
- CompatiblePairs, R 450
- Compilation, *R 815*
- Compiling Library Code, *R 35*
- Complementclasses, R 352
- ComplementclassesEA, R 372
- ComplementIntMat, R 234
- ComplementSystem, R 355
- CompleteSchreierTransversal, N 17
- Completion Files, *R 33*
- ComplexConjugate, R 160
  - for class functions, R 756
- ComplexificationQuat, R 604
- Component Objects, *P 20*
- Components of a Dixon Record, *R 738*
- Components versus Attributes, *P 39*
- CompositionMapping, R 297
  - for Frobenius automorphisms, R 576

- CompositionMapping2, R 297
- CompositionMaps, R 793
- CompositionOfStraightLinePrograms, R 334
- CompositionSeries, R 360
  - for groups with pcgs, R 441
- ComputedBrauerTables, R 712
- ComputedClassFusions, R 789
- ComputedIndicators, R 729
- ComputedIsPSolvableCharacterTables, R 729
- ComputedPowerMaps, R 785
- ComputedPrimeBlockss, R 725
- Computing a Pcgs, *R 426*
- Computing a Permutation Representation, *R 406*
- Computing Pc Groups, *R 447*
- Computing Possible Permutation Characters, *R 777*
- Computing the Irreducible Characters of a Group, *R 734*
- Concatenation, R 193
  - concatenation, of lists, R 193
- Conductor, R 155
- ConfluentRws, R 337
- Congruences, for character tables, R 801
- Congruences for semigroups, *R 529*
- ConjugacyClass, R 349
- Conjugacy Classes, *R 349*
- ConjugacyClasses, attribute, R 349
  - for character tables, R 715
  - for groups with pcgs, R 441
  - for linear groups, R 504
- ConjugacyClassesByOrbits, R 350
- ConjugacyClassesByRandomSearch, R 350
- Conjugacy Classes in Classical Groups, *R 504*
- Conjugacy Classes in Solvable Groups, *R 441*
- ConjugacyClassesMaximalSubgroups, R 364
- ConjugacyClassesPerfectSubgroups, R 367
- ConjugacyClassesSubgroups, R 364
- ConjugacyClassSubgroups, R 363
- conjugate, matrix, R 217
  - of a word, R 326
- ConjugateDominantWeight, R 634
- ConjugateDominantWeightWithWord, R 634
- ConjugateGroup, R 342
- Conjugates, R 570
- ConjugateSubgroup, R 344
- ConjugateSubgroups, R 344
- conjugation, R 388
- ConjugatorAutomorphism, R 380
- ConjugatorAutomorphismNC, R 380
- ConjugatorIsomorphism, R 380
- ConjugatorOfConjugatorIsomorphism, R 381
- ConnectGroupAndCharacterTable, R 716
- ConsiderKernels, R 801
- ConsiderSmallerPowerMaps, R 802
- ConsiderStructureConstants, R 793
- ConsiderTableAutomorphisms, R 804
- constants, T 20
- ConstantTimeAccessList, R 189
- constituent, of a group character, R 760
- ConstituentsCompositionMapping, R 297
- ConstituentsOfCharacter, R 761
- Constructing Algebras as Free Algebras, *R 601*
- Constructing Algebras by Generators, *R 600*
- Constructing Algebras by Structure Constants, *R 602*
- Constructing Character Tables from Others, *R 740*
- Constructing Domains, *R 280*
- Constructing Lie algebras, *R 626*
- Constructing Pc Groups, *R 445*
- Constructing Subdomains, *R 284*
- Constructing Tables of Marks, *R 689*
- Constructing Vector Spaces, *R 584*
- Construction of Abelian Number Fields, *R 577*
- Construction of Stabilizer Chains, *R 411*
- Constructors for Basic Groups, *R 505*
- ContainedCharacters, R 800
- ContainedDecomposables, R 800
- ContainedMaps, R 795
- ContainedPossibleCharacters, R 798
- ContainedPossibleVirtualCharacters, R 798
- ContainedSpecialVectors, R 799
- ContainedTom, R 698
- ContainingTom, R 698
- continuation, E 24
- continue statement, R 54
- Conventions for Character Tables, *R 715*
- convert, to a string, R 245
- Converting Groups to Finitely Presented Groups, *R 462*
- ConvertToCharacterTable, R 713
- ConvertToCharacterTableNC, R 713
- ConvertToMatrixRep, R 229
- ConvertToMatrixRepNC, R 229
- ConvertToRangeRep, R 202
- ConvertToStringRep, R 245
- ConvertToTableOfMarks, R 693
- ConvertToVectorRep, R 210

- ConvertToVectorRepNC, R 210
  - ConwayPolynomial, R 576
  - Conway Polynomials, R 576
  - coprime, R 47
  - Copy, *T 80*
  - copy, R 113
    - an object, R 113
  - Copying Weak Pointer Objects, *E 53*
  - CopyOptionsDefaults, R 416
  - Copyrights, *R 827*
  - CopyStabChain, R 415
  - Core, R 351
  - CorrespondingGeneratorsByModuloPcgs, R 434
  - coset, R 346
  - CosetLeadersMatFFE, R 213
  - Cosets, *R 346*
  - CosetTable, R 457
  - CosetTableBySubgroup, R 458
  - CosetTableDefaultLimit, R 459
  - CosetTableDefaultMaxLimit, R 458
  - CosetTableFromGensAndRels, R 458
  - CosetTableInWholeGroup, R 461
  - CosetTableOfFpSemigroup, R 542
  - Coset Tables and Coset Enumeration, *R 457*
  - Coset tables for subgroups in the whole group, *R 461*
  - CosetTableStandard, R 460
  - CRC, R 36
  - CrcFile, R 94
    - example, R 36
  - CRC Numbers, *R 36*
  - CreateCompletionFiles, R 34
  - CreateCompletionFilesPackage, *E 40*
  - CreateCompletionFilesPkg, R 832
  - Creating Attributes and Properties, *P 17*
  - Creating Categories, *P 16*
  - Creating Character Tables, *R 711*
  - Creating Class Functions from Values Lists, *R 757*
  - Creating Class Functions using Groups, *R 758*
  - Creating Families, *P 18*
  - Creating Finite Fields, *R 574*
  - Creating Finitely Presented Groups, *R 454*
  - Creating Finitely Presented Semigroups, *R 538*
  - Creating Group Homomorphisms, *R 375*
  - Creating Groups, *R 341*
  - Creating hom cosets and quotient groups, *N 14*
  - Creating Mappings, *R 296*
  - Creating Objects, *P 20*
  - Creating Operations, *P 18*
  - Creating Other Filters, *P 18*
  - Creating Own Arithmetic Objects, *P 41*
  - Creating Permutations, *R 404*
  - Creating Presentations, *R 471*
  - Creating Representations, *P 16*
  - Creating Types, *P 20*
  - Creation of Algebraic Extensions, *R 677*
  - Creation of Rational Functions, *R 674*
  - Credit, *R 21*
  - CrystGroupDefaultAction, R 425
  - Cycle, R 396
  - CycleLength, R 396
  - CycleLengths, R 396
  - Cycles, R 396
  - CycleStructureClass, R 762
  - CycleStructurePerm, R 404
  - CyclicExtensionsTom, R 698
  - CyclicGroup, R 499
  - CyclotomicField, R 577
  - cyclotomic field elements, R 153
  - cyclotomic fields, canonicalbasis, R 579
  - CyclotomicPolynomial, R 662
  - Cyclotomic Polynomials, *R 662*
  - Cyclotomics, R 153
  - cyclotomics, defaultfield, R 578
- D**
- $d_N$ , R 157
  - Darstellungsgruppe, see *EpimorphismSchurCover*, R 372
  - DataType, R 124
  - data type, unknown, R 163
  - DayDMY, R 251
  - DaysInMonth, R 251
  - DaysInYear, R 251
  - Debugging, *T 85*
  - Debugging Recursion, *R 83*
  - DEC, R 237
  - Declaration and Implementation Part, *E 37, P 33*
  - DeclareAttribute, P 31
    - example, P 37
  - DeclareAutoPackage, R 832
  - DeclareAutoreadableVariables, *E 40*
  - DeclareAutoreadableVariables, *E 40*
  - DeclareCategory, P 31
  - DeclareFilter, P 31
  - DeclareGlobalFunction, P 31
  - DeclareGlobalVariable, P 32

- DeclareHandlingByNiceBasis, R 598
- DeclareInfoClass, R 78
- DeclareOperation, P 31
- DeclarePackage, R 832
- DeclarePackageAutoDocumentation, R 832
- DeclarePackageDocumentation, R 832
- DeclareProperty, P 31
- DeclareRepresentation, P 31
  - belongs to implementation part, P 33
  - example, P 37
- DeclareSynonym, P 32
- DeclareSynonymAttr, P 32
- DecodeTree, R 488
- DecodeTree, *R 488*
- decompose, a group character, R 760
- DecomposedFixedPointVector, R 699
- DecomposeTensorProduct, R 642
- Decomposition, R 237
- DecompositionInt, R 238
- DecompositionMatrix, R 727
- decomposition matrix, R 237
- Decompositions, *R 237*
- Decreased, R 769
- DefaultField, R 566
  - for cyclotomics, R 156
  - for finite field elements, R 574
- DefaultFieldByGenerators, R 567
- DefaultFieldOfMatrix, R 218
- DefaultFieldOfMatrixGroup, R 420
- DefaultRing, R 550
  - for finite field elements, R 574
- DefaultRingByGenerators, R 551
- DefaultStabChainOptions, R 413
- Defining a Pcgs Yourself, *R 427*
- DefiningPolynomial, R 568
- DefiningQuotientHomomorphism, R 466
- DegreeFFE, R 573
- DegreeIndeterminate, R 660
- DegreeOfBinaryRelation, R 308
- DegreeOfCharacter, R 760
- DegreeOfLaurentPolynomial, R 659
- DegreeOfTransformation, R 543
- DegreeOfTransformationSemigroup, R 529
- DegreeOverPrimeField, R 568
- Delta, R 807
- Denominator, T 78
- denominator, of a rational, R 142
- DenominatorCyc, R 155
- DenominatorOfModuloPcgs, R 433
- DenominatorOfRationalFunction, R 657
- DenominatorRat, R 142
- DenseHashTable, N 11
- Dense hash tables, *N 11*
- DenseIntKey, N 11
- deprecated, R 832
- DepthOfPcElement, R 429
- DepthOfUpperTriangularMatrix, R 227
- DepthVector, T 78
- Derangements, R 147
- Derivations, R 627
- Derivative, R 661
- DerivedLength, R 360
- DerivedSeriesOfGroup, R 360
- DerivedSubgroup, R 352
- DerivedSubgroupsTom, R 697
- DerivedSubgroupsTomPossible, R 697
- DerivedSubgroupsTomUnique, R 697
- DerivedSubgroupTom, R 697
- DescriptionOfRootOfUnity, R 156
- Designing new Multiplicative Objects, *P 63*
- Determinant, R 218
- determinant character, R 762
- DeterminantIntMat, R 237
- DeterminantMat, R 218
- DeterminantMatDestructive, R 219
- DeterminantMatDivFree, R 219
- Determinant of an integer matrix, *R 237*
- DeterminantOfCharacter, R 762
- Developing rewriting systems, *R 339*
- DiagonalizeIntMat, R 235
- DiagonalizeMat, R 224
- DiagonalMat, R 220
- DiagonalOfMat, R 226
- Dictionaries, *N 9*
- DictionaryByPosition, N 10
- Difference, R 268
- DifferenceBlist, R 205
- Different Notions of Generation, *T 81*
- DihedralGroup, R 500
- Dimension, R 564
- DimensionOfHighestWeightModule, R 643
- DimensionOfMatrixGroup, R 420
- DimensionOfVectors, R 593
- DimensionsLoewyFactors, R 361
- DimensionsMat, R 218
- Directories, *R 90*

- DirectoriesLibrary, R 90
  - DirectoriesPackageLibrary, R 830
  - DirectoriesPackagePrograms, R 830
  - DirectoriesSystemPrograms, R 91
  - Directory, R 90
  - DirectoryContents, R 91
  - DirectoryCurrent, R 90
  - DirectoryTemporary, R 90
  - DirectProduct, R 494
  - Direct product chain subgroups, *N 21*
  - DirectProductOp, R 494
  - Direct Products, *R 494*
  - DirectSumDecomposition, R 612
    - for Lie algebras, R 631
  - Direct Sum Decompositions, *R 630*
  - DirectSumOfAlgebraModules, R 623
    - for Lie algebras, R 646
  - DirectSumOfAlgebras, R 611
  - DisableAttributeValueStoring, R 122
  - disable automatic loading, R 828
  - Discriminant, R 661
  - Display, R 65
    - for character tables, R 731
    - for tables of marks, R 691
  - DisplayCacheStats, R 82
  - DisplayCompositionSeries, R 360
  - DisplayEggBoxOfDClass, R 531
  - DisplayImfInvariants, R 520
  - DisplayInformationPerfectGroups, R 513
  - DisplayOptions, R 732
  - DisplayOptionsStack, R 88
  - DisplayProfile, R 81
  - DisplayRevision, R 82
  - DistancesDistributionMatFFEVecFFE, R 212
  - DistancesDistributionVecFFESVecFFE, R 212
  - DistanceVecFFE, R 212
  - Distinguished Subalgebras, *R 628*
  - division, R 47
    - operation, R 289
  - DivisionRingByGenerators, R 567
  - division rings, R 566
  - divisors, of an integer, R 132
  - DivisorsInt, R 132
  - Dixon-Schneider algorithm, R 736
  - DixonInit, R 737
  - DixonRecord, R 737
  - DixonSplit, R 737
  - DixontinI, R 737
  - DMYDay, R 251
  - DMYhmsSeconds, R 252
  - DnLattice, R 770
  - DnLatticeIterative, R 771
  - do, R 51
  - document formats, for help books, E 43
  - document formats (text, dvi, ps, pdf, html), R 23
  - Domain, R 285
  - DomainByGenerators, R 285
  - Domain Categories, *R 282*
  - Domain Constructors, *T 69*
  - Domains, *R 110*
  - Domains as Sets, *T 68*
  - Domains Generated by Class Functions, *R 783*
  - Domains of Subspaces of Vector Spaces, *R 585*
  - DominantCharacter, R 642
  - DominantWeights, R 642
  - DoubleCoset, R 348
  - DoubleCosetRepsAndSizes, R 349
  - Double Cosets, *R 348*
  - DoubleCosets, operation, R 348
  - DoubleCosetsNC, operation, R 348
  - DoubleHashArraySize, N 11
  - doublequote character, R 244
  - doublequotes, R 242
  - DownEnv, R 69, T 85
  - Dummy Streams, *R 105*
  - duplicate free, R 188
  - DuplicateFreeList, R 193
  - Duplication of Lists, *R 175*
  - Duplication of Objects, *R 113*
  - DxIncludeIrreducibles, R 738
- ## E
- E, R 153
  - $e_N$ , R 157
  - EANormalSeriesByPcgs, R 435
  - Earns, R 397
  - EB, R 157
  - EC, R 157
  - Echelonized Matrices, *R 224*
  - ED, R 157
  - Edit, R 73
  - Editing Files, *R 73*
  - Editor Support, *R 73*
  - EE, R 157
  - EF, R 157
  - Efficiency of Homomorphisms, *R 378*

- EG, R 157
- EggBoxOfDClass, R 531
- EH, R 157
- EI, R 158
- Eigenspaces, R 223
- Eigenvalues, R 223
- EigenvaluesChar, R 763
- Eigenvectors, R 223
- Eigenvectors and eigenvalues, *R 223*
- EJ, R 158
- EK, R 158
- EL, R 158
- ElementaryAbelianGroup, R 500
- ElementaryAbelianSeries, R 360
- ElementaryAbelianSeriesLargeSteps, R 360
- Elementary Divisors, *R 223*
- ElementaryDivisorsMat, R 224
- ElementaryDivisorsMatDestructive, R 224
- Elementary Operations for a Pcgs, *R 428*
- Elementary Operations for a Pcgs and an Element, *R 428*
- Elementary Operations for Integers, *R 125*
- Elementary Operations for Rationals, *R 141*
- Elementary Tietze Transformations, *R 482*
- ElementOfFpGroup, R 456
- ElementOfFpSemigroup, R 540
- ElementOfMagmaRing, R 650
- ElementOrdersPowerMap, R 786
- ElementProperty, R 417
- Elements, R 265, T 78
- elements, T 24
  - definition, R 109
  - of a list or collection, R 265
- Elements as equivalence classes, *R 109*
- ElementsFamily, P 20, R 260
- Elements in Algebraic Extensions, *R 677*
- Elements of Finitely Presented Groups, *T 84*
- Elements of Free Magma Rings, *R 649*
- Elements of pc groups, *R 444*
- ElementsStabChain, R 415
- Elements with Prescribed Images, *R 392*
- element test, for lists, R 177
- elif, R 50
- EliminatedWord, R 328
- EliminationOrdering, R 670
- ElmWPObj, E 52
- else, R 50
- EM, R 158
- emacs, R 73
- email addresses, T 16
- Embedding, R 298
  - example for direct products, R 494
  - example for semidirect products, R 496
  - example for wreath products, R 497
  - for group products, R 498
  - for Lie algebras, R 626
  - for magma rings, R 650
- embeddings, find all, R 384
- Embeddings and Projections for Group Products, *R 498*
- EmptyBinaryRelation, R 307
- EmptyMatrix, R 220
- EmptySCTable, R 602
- EmptyStabChain, R 416
- EnableAttributeValueStoring, R 122
- End, R 596
- end, R 54
- Enforcing Property Tests, *P 35*
- Enlarging Internally Represented Lists, *R 177*
- Enumerator, R 261
- enumerator, T 49
- EnumeratorByBasis, R 589
- EnumeratorByFunctions, R 261
- Enumerators, *R 203*
- EnumeratorSorted, R 261
- environment, R 54
- EpimorphismNilpotentQuotient, R 468
- EpimorphismPGroup, R 467
- EpimorphismQuotientSystem, R 467
- epimorphisms, find all, R 384
- EpimorphismSchurCover, R 372
- equality, associative words, R 326
  - elements of finitely presented groups, R 454
  - nonassociative words, R 319
  - of records, R 257
  - operation, R 288
  - pcwords, R 444
- Equality and Comparison of Domains, *R 280*
- equality test, R 46
  - for permutations, R 403
- equivalence class, R 310
- Equivalence Classes, *R 310*
- EquivalenceClasses, attribute, R 311
- EquivalenceClassOfElement, R 311
- EquivalenceClassOfElementNC, R 311
- EquivalenceClassRelation, R 311

- equivalence relation, R 308
- EquivalenceRelationByPairs, R 310
- EquivalenceRelationByPairsNC, R 310
- EquivalenceRelationByPartition, R 310
- EquivalenceRelationByPartitionNC, R 310
- EquivalenceRelationByProperty, R 310
- EquivalenceRelationByRelation, R 310
- EquivalenceRelationPartition, R 310
- Equivalence Relations, *R 309*
- ER, R 158
- Error, R 71
- Error, *R 71*
- ErrorCount, R 71
- ErrorCount, *R 71*
- ErrorNoTraceBack, R 67
- errors, syntax, R 63
- ES, R 158
- escaped characters, R 244
- escaping non-special characters, R 244
- ET, R 158
- EU, R 158
- EuclideanDegree, R 558
- EuclideanQuotient, R 558
- EuclideanRemainder, R 558
- Euclidean Rings, *R 558*
- Euler's totient function, R 134
- EulerianFunction, R 359
- EulerianFunctionByTom, R 699
- EV, R 158
- EvalStraightLineProgElm, R 335
- EvalString, R 251
- evaluation, R 41
  - strings, R 250
- EW, R 158
- EX, R 158
- ExactSizeConsiderFunction, R 369
- Example – Constructing Enumerators, *P 24*
- Example – Constructing Iterators, *P 26*
- Example: Groups with a decomposition as semidirect product, *P 41*
- Example: Groups with a word length, *P 40*
- Example: M-groups, *P 40*
- Examples, Lists, and Verbatim, *E 20*
- Exec, R 108
- Exec, *R 108*
- execution, R 48
- exit, R 71
- expanded form of monomials, R 673
- Expert Windows installation, *R 826*
- Exponent, R 359
  - for character tables, R 720
- exponent, of the prime residue group, R 134
- exponentiation, operation, R 289
- ExponentOfPcElement, R 428
- ExponentsConjugateLayer, R 430
- ExponentsOfCommutator, R 430
- ExponentsOfConjugate, R 430
- ExponentsOfPcElement, R 428
- ExponentsOfRelativePower, R 430
- Exponents of Special Products, *R 430*
- ExponentSumWord, R 327
- ExponentSyllable, R 328
- Expressing Group Elements as Words in Generators, *R 345*
- Expressions, *R 41*
- ExtendedGroup, N 20
- ExtendedPcgs, R 432
- Extending the Range of Definition of an Existing Operation, *P 35*
- ExtendSchreierTransversal, N 17
- ExtendSchreierTransversalShortCube, N 17
- ExtendSchreierTransversalShortTree, N 17
- ExtendStabChain, R 416
- Extension, R 449
- ExtensionNC, R 449
- ExtensionRepresentatives, R 450
- Extensions, R 449
- Extensions of the p-adic Numbers, *R 680*
- ExteriorPowerOfAlgebraModule, R 646
- ExternalOrbit, R 400
- ExternalOrbits, R 400
- ExternalOrbitsStabilizers, R 400
- External Representation, *P 28*
- External Representation for Nonassociative Words, *R 322*
- external representation of polynomials, R 673
- ExternalSet, E 48, R 399
- external set, T 48
- External Sets, *R 399*
- ExternalSubset, R 400
- Extract, R 767
- ExtraspecialGroup, R 500
- ExtRepDenominatorRatFun, R 674
- ExtRepNumeratorRatFun, R 674
- ExtRepOfObj, P 29
  - external representation, for cyclotomics, R 156

- ExtRepPolynomialRatFun, R 674
- EY, R 158
- F**
- F, Function mark-up, E 16
- $f_N$ , R 157
- FactorCosetAction, R 395
  - for fp groups, R 458
- FactorCosetOperation, R 458
- FactorFreeSemigroupByRelations, R 538
- FactorGroup, R 362
- FactorGroupFpGroupByReIs, R 454
- FactorGroupNC, R 362
- FactorGroupNormalSubgroupClasses, R 748
- Factor Groups, R 362
- Factor Groups of Polycyclic Groups - Modulo Pcgs, R 432
- Factor Groups of Polycyclic Groups in their Own Representation, R 434
- FactorGroupTom, R 700
- Factorial, R 143
- Factorization, R 346
- factorization, R 345
- Factors, R 558
  - of univariate polynomial, R 662
- FactorsInt, R 131
- FactorsOfDirectProduct, R 741
- FactorsSquarefree, R 663
- Fail, R 165, T 77
- fail, R 165
- fail instead of false, T 77
- FaithfulModule, R 622
  - for Lie algebras, R 640
- Families, R 115
- FamiliesOfGeneralMappingsAndRanges, R 306
- FamiliesOfRows, R 747
- family, T 31
- FamilyForOrdering, R 274
- FamilyObj, R 115
- FamilyPcgs, R 443
- FamilyRange, R 306
- FamilySource, R 306
- FAQ, R 818
- Fast access to last hash index, N 11
- features, under UNIX, R 27
- fi, R 50
- Fibonacci, R 151
- Fibonacci and Lucas Sequences, R 151
- Field, R 566
- FieldExtension, R 568
- field homomorphisms, Frobenius, R 576
- FieldOfMatrixGroup, R 420
- FieldOverItselfByGenerators, R 567
- fields, R 566
- File Access, R 92
- FileDescriptorOfStream, R 97
- Filename, R 91
- Filename, R 91
- File Operations, R 93
- File Streams, R 102
- File Structure, E 32
- File Types, E 32
- Filtered, R 196
- Filters, R 116
- filters, T 73
- Filters Controlling the Arithmetic Behaviour of Lists, R 179
- Finding Implementations in the Library, E 33
- Finding Positions in Lists, R 185
- Finding Submodules, R 683
- FindS12, R 638
- Finish Installation and Cleanup, R 817
- Finite Field Elements, R 572
- Finitely Presented Lie Algebras, R 638
- Finitely presented monoids, R 540
- finiteness test, for a list or collection, R 265
- Finite Perfect Groups, R 511
- First, R 197
- FittingSubgroup, R 353
- Flat, R 194
- FlushCaches, P 33
- flush character, R 244
- foa triples, E 46
- For, R 51
- ForAll, R 198
- For and While Loops, T 33
- ForAny, R 198
- for loop, R 51
- Forming Closures of Domains, T 70
- FpElmComparisonMethod, R 455
- FpGroupPresentation, R 471
- FpGrpMonSmsgOfFpGrpMonSmsgElement, R 538
- FpLieAlgebraByCartanMatrix, R 639
- frame, R 772
- FrattiniSubgroup, R 353
  - for groups with pcgs, R 441

- FreeAlgebra, R 601
  - FreeAlgebraWithOne, R 601
  - FreeAssociativeAlgebra, R 601
  - FreeAssociativeAlgebraWithOne, R 601
  - FreeGeneratorsOfFpGroup, R 455
  - FreeGeneratorsOfFpSemigroup, R 539
  - FreeGeneratorsOfWholeGroup, R 455
  - FreeGroup, R 323
  - FreeGroupOfFpGroup, R 455
  - Free Groups, Monoids and Semigroups, R 323
  - FreeLeftModule, R 564
  - FreeLieAlgebra, R 627
  - FreeMagma, R 321
  - FreeMagmaRing, R 648
  - Free Magma Rings, R 648
  - Free Magmas, R 321
  - FreeMagmaWithOne, R 321
  - Free Modules, R 563
  - FreeMonoid, R 534
    - with example, R 324
  - FreeMonoidOfRewritingSystem, R 542
  - FreeSemigroup, R 324
    - with examples, R 528
  - FreeSemigroupOfFpSemigroup, R 539
  - FreeSemigroupOfRewritingSystem, R 542
  - Frobenius automorphism, R 576
  - FrobeniusAutomorphism, R 576
  - FrobeniusAutomorphism, R 576
  - FrobeniusCharacterValue, R 781
  - FullMatrixAlgebra, R 604
  - FullMatrixAlgebraCentralizer, R 612
  - FullMatrixLieAlgebra, R 627
  - FullMatrixModule, R 565
  - FullMatrixSpace, R 593
  - FullRowModule, R 565
  - FullRowSpace, R 593
  - FullTransformationSemigroup, R 529
  - Function, R 54
  - function, R 54
  - FunctionAction, R 399
  - function call, R 45
    - with arguments, R 45
    - with options, R 45
  - Function Calls, R 45
  - FunctionOperation, R 832
  - functions, R 296
    - definition by arrow notation, R 56
    - definition of, R 54
    - recursive, R 54
    - with a variable number of arguments, R 45
  - FunctionsFamily, R 62
  - Functions for Coding Theory, R 212
  - Functions for GAP Packages, R 829
  - Functions that do nothing, R 61
  - Function that Modify Boolean Lists, R 206
  - Function Types, R 61
  - Further Improvements in Implementing Residue Class Rings, P 61
  - Further Information about Domains, T 71
  - Further Information about Functions, T 43
  - Further Information about GAP, T 16
  - Further Information about Groups and Homomorphisms, T 57
  - Further Information about Lists, T 38
  - Further Information about Vector Spaces and Algebras, T 67
  - Further Information introducing the System, T 26
  - FusionCharTableTom, R 706
  - FusionConjugacyClasses, R 788
  - FusionConjugacyClassesOp, R 788
  - fusions, R 788
  - FusionsAllowedByRestrictions, R 804
  - FusionsTom, R 695
- ## G
- G-sets, E 48, R 387
  - $g_N$ , R 157
  - gac, R 34
  - Galois Action, R 568
  - Galois Conjugacy of Cyclotomics, R 159
  - GaloisCyc, R 159
    - for class functions, R 756
  - GaloisField, R 575
  - GaloisGroup, of field, R 569
    - of rational class of a group, R 351
  - Galois Groups of Abelian Number Fields, R 581
  - GaloisMat, R 161
  - GaloisStabilizer, R 579
  - GaloisType, R 663
  - gap.rc, R 33
  - GAP3, R 33
  - Gap3CatalogueIdGroup, R 509
  - GAPDocManualLab, E 41
  - GAP for Macintosh OS X, R 822
  - GAP for MacOS, R 823
  - GAPInfo, R 833

- GAPInfo.RootPaths, R 29
- GAPInfo.Version, E 40
- GapInputPcGroup, R 448
- GapInputSCTable, R 602
- GAPKB\_REW, R 541
- gapmacro.tex, E 11
- GAP Root Directory, *R 89*
- GasmanLimits, R 85
- GasmanMessageStatus, R 85
- GasmanStatistics, R 85
- Gaussian algorithm, R 222
- GaussianIntegers, R 583
- GaussianRationals, R 578
- Gaussians, *R 583*
- Gcd, R 559
- Gcd and Lcm, *R 559*
- Gcdex, R 129
- GcdInt, R 128
- GcdOp, R 559
- GcdRepresentation, R 559
- GcdRepresentationOp, R 559
- General Binary Relations, *R 307*
- General hash table definitions and operations, *N 10*
- General Hash Tables, *N 10*
- GeneralisedEigenspaces, R 223
- GeneralisedEigenvalues, R 223
- generalized characters, R 750
- Generalized Conjugation Technique, *E 54*
- generalized conjugation technique, *E 54*
- GeneralizedEigenspaces, R 223
- GeneralizedEigenvalues, R 223
- GeneralLinearGroup, R 501
- GeneralMappingByElements, R 296
- General Mappings, *R 305*
- GeneralMappingsFamily, R 306
- General operations on transversals, *N 16*
- GeneralOrthogonalGroup, R 503
- GeneralUnitaryGroup, R 502
- Generating Fields, *R 566*
- Generating modules, *R 562*
- Generating Rings, *R 550*
- GeneratingSetIsComplete, N 19
- generator, of the prime residue group, R 136
- GeneratorsOfAdditiveGroup, R 548
- GeneratorsOfAdditiveMagma, R 548
- GeneratorsOfAdditiveMagmaWithZero, R 548
- GeneratorsOfAlgebra, R 608
- GeneratorsOfAlgebraModule, R 619
- GeneratorsOfAlgebraWithOne, R 608
- GeneratorsOfDivisionRing, R 567
- GeneratorsOfDomain, R 284
- GeneratorsOfEquivalenceRelationPartition, R 310
- GeneratorsOfField, R 567
- GeneratorsOfGroup, R 342
- GeneratorsOfIdeal, R 553
- GeneratorsOfLeftIdeal, R 554
- GeneratorsOfLeftModule, R 562
- GeneratorsOfLeftOperatorAdditiveGroup, R 562
- GeneratorsOfLeftVectorSpace, R 585
- GeneratorsOfMagma, R 315
- GeneratorsOfMagmaWithInverses, R 315
- GeneratorsOfMagmaWithOne, R 315
- GeneratorsOfMonoid, R 534
- GeneratorsOfNearAdditiveGroup, R 548
- GeneratorsOfNearAdditiveMagma, R 548
- GeneratorsOfNearAdditiveMagmaWithZero, R 548
- GeneratorsOfPresentation, R 471
- GeneratorsOfRightIdeal, R 554
- GeneratorsOfRightModule, R 563
- GeneratorsOfRightOperatorAdditiveGroup, R 562
- GeneratorsOfRing, R 551
- GeneratorsOfRingWithOne, R 555
- GeneratorsOfRws, R 337
- GeneratorsOfSemigroup, R 527
- GeneratorsOfSomething, T 69
- GeneratorsOfStruct, R 281
- GeneratorsOfTwoSidedIdeal, R 553
- GeneratorsOfVectorSpace, R 585
- GeneratorsPrimeResidues, R 135
- GeneratorsSmallest, R 369
- GeneratorsSubgroupsTom, R 703
- GeneratorSyllable, R 328
- Generic Construction of Tables of Marks, *R 707*
- GetFusionMap, R 790
- GetHashEntry, N 10
- GetHashEntryAtLastIndex, N 12
- GetHashEntryIndex, N 11
- getter, of an attribute, T 72
- Get the Archives, *R 813*
- getting help, R 22
- GF, R 575
- GL, R 501
- GL and SL, *R 421*
- Global Memory Information, *R 85*

- Global Variables in the Library, *P 31*
  - GModuleByMats, R 682
  - GU, R 503
  - GQuotients, R 384
  - Grading, R 613
  - Green's Relations, *R 530*
  - GreensDClasses, R 531
  - GreensDClassOfElement, R 531
  - GreensDRelation, R 530
  - GreensHClasses, R 531
  - GreensHClassOfElement, R 531
  - GreensHRelation, R 530
  - GreensJClasses, R 531
  - GreensJClassOfElement, R 531
  - GreensJRelation, R 530
  - GreensLClasses, R 531
  - GreensLClassOfElement, R 531
  - GreensLRelation, R 530
  - GreensRClasses, R 531
  - GreensRClassOfElement, R 531
  - GreensRRelation, R 530
  - Groebner Bases, *R 671*
  - GroebnerBasis, R 671
  - GroebnerBasisNC, R 671
  - Group, R 341
  - group actions, R 388
    - operations syntax, R 387
  - Group Actions - Name Changes, *R 832*
  - group algebra, R 648
  - Group Automorphisms, *R 380*
  - GroupByRws, R 446
  - GroupByRwsNC, R 446
  - group characters, R 750
  - Group Elements, *R 341*
  - group general mapping, T 55
    - single-valued, T 55
    - total, T 55
  - GroupGeneralMappingByImages, R 376
  - GroupHClassOfGreensDClass, R 532
  - GroupHomomorphismByFunction, R 376
  - GroupHomomorphismByImages, R 375
  - GroupHomomorphismByImagesNC, R 375
  - GroupHomomorphismByImages vs. GroupGeneralMappingByImages, T 55
  - Group Homomorphisms, Group Homomorphisms,
    - by Images, *T 54*
  - GroupOfPcgs, R 428
  - group operations, R 388
  - Group Properties, *R 356*
  - GroupRing, R 648
  - group ring, R 648
  - Groups of Automorphisms, *R 382*
  - GroupStabChain, R 414
  - GroupWithGenerators, R 342
  - GU, R 502
- ## H
- $h_N$ , R 157
  - HallSubgroup, R 354
  - HallSystem, R 355
    - for groups with pcgs, R 441
  - Handling of Streams in the Background, *R 105*
  - HasAbelianFactorGroup, R 363
  - HasChainHomomorphicImage, N 20
  - HasElementaryAbelianFactorGroup, R 363
  - HashFunc, N 11
  - HashKeyEnumerator, N 10
  - Hash keys, *N 10*
  - HasIndeterminateName, R 655
  - HasParent, R 283
  - HasseDiagramBinaryRelation, R 309
  - HeadPcElementByNumber, R 430
  - Help, *T 25*
  - HELP\_ADD\_BOOK, E 42
  - HenselBound, R 664
  - hermite normal form, R 832
  - HermiteNormalFormIntegerMat, R 235
  - HermiteNormalFormIntegerMatTransform, R 235
  - HeuristicCancelPolynomials, R 676
  - HexStringInt, R 247
  - HighestWeightModule, R 645
  - History of Character Theory Stuff in GAP, *R 710*
  - HMSMSec, R 252
  - Hom, R 596
  - HomCoset, N 14
  - Hom coset chain subgroups, *N 20*
  - HomCosetWithImage, N 14
  - HomeEnumerator, R 399
  - Homomorphism, for quotient groups by
    - homomorphisms, N 14
    - for subgroup transversals, N 17
  - homomorphism, action, T 48
    - natural, T 45
    - operation, T 48
  - Homomorphism for very large groups, *R 379*
  - HomomorphismQuotientSemigroup, R 530

- homomorphisms, find all, R 383
- homomorphisms, Frobenius, field, R 576
- Homomorphisms of Algebras, R 613
- Homomorphisms vs. Factor Structures, T 83
- Homomorphisms vs. General Mappings, T 83
- HomomorphismTransformationSemigroup, R 529
- HomTransversal, N 17
- How to Implement New Kinds of Vector Spaces, R 598
- HumanReadableDefinition, R 701
- I**
- $i_N$ , R 158
- Ideal, R 552
- IdealByGenerators, R 553
- IdealNC, R 553
- Ideals, R 606
- Ideals in Rings, R 552
- Ideals of semigroups, R 529
- Idempotents, R 316
- IdempotentsTom, R 695
- IdempotentsTomInfo, R 695
- Identical Lists, R 174, T 29
- Identical Objects, R 110
- Identical Records, R 256
- IdentificationOfConjugacyClasses, R 716
- Identifier, for character tables, R 722
  - for tables of marks, R 695
- identifier, T 22
- Identifiers, R 40
- Identity, R 285
- IdentityBinaryRelation, R 307
- IdentityFromSCTable, R 603
- IdentityMapping, R 298
- IdentityMat, R 219
- IdentityTransformation, R 543
- IdFunc, R 61
- IdGap3SolvableGroup, R 509
- IdGroup, R 509
- IdSmallGroup, R 509
- IdsOfAllSmallGroups, R 509
- If, R 50
- if statement, R 50
- If Statements, T 40
- If Things Go Wrong, R 818
- Image, R 299
  - for Frobenius automorphisms, R 576
- image, vector under matrix, R 217
- ImageElm, R 299
- ImageElt, N 14
- ImageGroup, N 17
- ImageListOfTransformation, R 543
- Images, R 300
- ImagesElm, R 299
- ImageSetOfTransformation, R 544
- ImagesRepresentative, R 299
- ImageSet, R 299
- ImagesSmallestGenerators, R 379
- ImageSource, N 14, R 299
- Images under Mappings, R 299
- ImfInvariants, R 522
- ImfMatrixGroup, R 523
- ImfNumberQClasses, R 520
- ImfNumberQQClasses, R 520
- ImfNumberZClasses, R 520
- Immediate Methods, P 13
- Immutability, T 30
- Immutable, R 112
- ImmutableBasis, R 591
- ImmutableMatrix, R 229
- Immutable Objects, T 80
- Implementing New List Objects, P 23
- in, for collections, R 268
  - for lists, R 177
  - for strictly sorted lists, R 191
  - operation for, R 268
- IndependentGeneratorsOfAbelianGroup, R 370
- Indeterminate, R 654
- IndeterminateName, R 655
- Indeterminateness, R 798
- IndeterminateNumberOfLaurentPolynomial, R 665
- IndeterminateNumberOfUnivariateRationalFunction, R 655
- IndeterminateOfUnivariateRationalFunction, R 655
- Indeterminates, R 654
- IndeterminatesOfPolynomialRing, R 665
- Index, R 343
- indexing commands, E 16
- IndexInWholeGroup, R 343
- IndexNC, R 343
- Index numbers of primitive groups, R 517
- Indicator, R 729
- IndicatorOp, R 729
- IndicesCentralNormalSteps, R 435

- IndicesChiefNormalSteps, R 436
- IndicesEANormalSteps, R 435
- IndicesInvoluntaryGenerators, R 460
- IndicesNormalSteps, R 437
- IndicesOfAdjointBasis, R 609
- IndicesPCentralNormalStepsPGroup, R 436
- IndicesStabChain, R 415
- Indirected, R 794
- Induced Actions, *R 684*
- InducedAutomorphism, R 382
- InducedClassFunction, R 764
- InducedClassFunctions, R 764
- InducedCyclic, R 765
- InducedPcgs, R 431
- InducedPcgsByGenerators, R 431
- InducedPcgsByGeneratorsNC, R 431
- InducedPcgsByPcSequence, R 431
- InducedPcgsByPcSequenceAndGenerators, R 431
- InducedPcgsByPcSequenceNC, R 431
- InducedPcgsWrtFamilyPcgs, R 443
- InducedPcgsWrtSpecialPcgs, R 439
- Inequalities, R 781
- inequality, of records, R 257
- inequality test, R 46
- InertiaSubgroup, R 761
- Infinity, *R 156*
- infinity, R 156
- inflated class functions, R 763
- Info, R 78
- InfoAlgebra, R 600
- InfoAttributes, R 122
- InfoBckt, R 417
- InfoCharacterTable, R 714
- InfoCoh, R 372
- InfoComplement, R 352
- InfoCoset, R 349
- InfoFpGroup, R 454
- Info Functions, *R 78*
- InfoGroebner, R 672
- InfoGroup, R 342
- InfoLattice, R 367
- InfoLevel, R 78
- InfoMatrix, R 215
- InfoMonomial, R 806
- InfoNumtheor, R 134
- InfoOptions, R 88
- InfoPcSubgroup, R 369
- Information about a function, *R 60*
- Information about the version used, *R 82*
- InfoText, R 723
- InfoTom, R 693
- InfoWarning, R 79
- init.g, for a GAP package, *E 37*
- InitFusion, R 803
- InitPowerMap, R 801
- Injection, N 18
- InjectionZeroMagma, R 314
- InnerAutomorphism, R 381
- InnerAutomorphismNC, R 381
- InnerAutomorphismsAutomorphismGroup, R 382
- inner product, of group characters, R 760
- In Parent Attributes, *E 47*
- InParentFOA, *E 47*
- Input-Output Streams, *R 103*
- InputLogTo, R 94
  - for streams, R 101
  - stop logging input, R 94
- InputOutputLocalProcess, R 104
- InputTextFile, R 102
- InputTextNone, R 105
- InputTextString, R 103
- InputTextUser, R 102
- InsertTrivialStabilizer, R 416
- InstallAtExit, R 71
- installation, R 813
- Installation of GAP for MacOS, *R 824*
- Installation of GAP Package Binaries, *E 38*
- Installation Overview, *R 813*
- InstallCharReadHookFunc, R 105
- InstalledPackageVersion, R 830
- InstallFactorMaintenance, R 291
- InstallFlushableValue, P 32
- InstallGlobalFunction, P 31
- InstallHandlingByNiceBasis, R 598
- InstallImmediateMethod, P 13
- Installing a GAP Package, *R 828*
- Installing a Help Book, *E 42*
- InstallIsomorphismMaintenance, R 291
- InstallMethod, P 11
- InstallOtherMethod, P 12
- InstallSubsetMaintenance, R 291
- InstallTrueMethod, P 14
- InstallValue, P 32
- Int, R 125
  - for cyclotomics, R 154
  - for strings, R 250

- INT.CHAR, R 249
- integer part of a quotient, R 128
- Integers, R 125
- Integral Bases of Abelian Number Fields, *R 579*
- IntegralizedMat, R 238
- IntegratedStraightLineProgram, R 334
- IntermediateGroup, R 362
- IntermediateSubgroups, R 362
- Internally Represented Cyclotomics, *R 162*
- Internally Represented Strings, *R 245*
- InterpolatedPolynomial, R 561
- IntersectBlist, R 206
- Intersection, R 267
  - for groups with pcgs, R 441
- intersection, of collections, R 267
  - of sets, R 192
- Intersection2, R 267
- IntersectionBlist, R 205
- IntersectionsTom, R 699
- IntersectSet, R 192
- IntFFE, R 574
- IntFFESymm, R 574
- IntHexString, R 250
- Introducing new Viewer for the Online Help, *E 44*
- IntScalarProducts, R 799
- IntVecFFE, R 574
- InvariantBilinearForm, R 422
- InvariantElementaryAbelianSeries, R 361
- Invariant Forms, *R 685*
- InvariantLattice, R 424
- InvariantQuadraticForm, R 422
- InvariantSesquilinearForm, R 422
- InvariantSubgroupsElementaryAbelianGroup, R 368
- Inverse, R 287
- inverse, group homomorphism, R 377
  - matrix, R 217
  - of class function, R 755
- InverseAttr, R 287
- InverseClasses, R 723
- InverseGeneralMapping, R 297
- InverseImmutable, R 287
- InverseMap, R 793
- InverseMatMod, R 231
- InverseMutable, R 287
- InverseOp, R 287
- InverseRepresentative, R 415
- InverseSameMutability, R 287
- InverseSM, R 287
- Invoking the Help, *R 22*
- Irr, R 718
- irrationalities, R 153
- IrrBaumClausen, R 734
- IrrConlon, R 734
- IrrDixonSchneider, R 734
- Irreducibility Tests, *R 683*
- irreducible character, R 759
- irreducible characters, computation, R 737
- IrreducibleDifferences, R 766
- Irreducible Maximal Finite Integral Matrix Groups, *R 518*
- IrreducibleModules, R 736
  - for groups with pcgs, R 441
- IrreducibleRepresentations, R 735
- IrreducibleRepresentationsDixon, R 736
- IrreducibleSolvableGroup, R 518
- IrreducibleSolvableGroupMS, R 517
- Irreducible Solvable Matrix Groups, *R 517*
- Is16BitsFamily, R 330
- Is32BitsFamily, R 330
- Is8BitsFamily, R 330
- IsAbelian, R 316
  - for character tables, R 720
- IsAbelianNumberField, R 578
- IsAbelianNumberFieldPolynomialRing, R 667
- IsAbelianTom, R 697
- IsAdditiveElement, R 292
- IsAdditiveElementWithInverse, R 292
- IsAdditiveElementWithZero, R 292
- IsAdditiveGroup, R 547
- IsAdditiveGroupGeneralMapping, R 304
- IsAdditiveGroupHomomorphism, R 304
- IsAdditivelyCommutative, R 548
- IsAdditivelyCommutativeElement, R 294
- IsAdditivelyCommutativeElementCollColl, R 294
- IsAdditivelyCommutativeElementCollection, R 294
- IsAdditivelyCommutativeElementFamily, R 294
- IsAdditiveMagma, R 546
- IsAdditiveMagmaWithInverses, R 547
- IsAdditiveMagmaWithZero, R 546
- IsAlgebra, R 607
- IsAlgebraGeneralMapping, R 305
- IsAlgebraHomomorphism, R 305
- IsAlgebraicElement, R 678

- IsAlgebraicExtension, R 677
- IsAlgebraModuleElement, R 619
- IsAlgebraModuleElementCollection, R 619
- IsAlgebraModuleElementFamily, R 619
- IsAlgebraWithOne, R 607
- IsAlgebraWithOneGeneralMapping, R 305
- IsAlgebraWithOneHomomorphism, R 305
- IsAlphaChar, R 246
- IsAlternatingGroup, R 408
- IsAnticommutative, R 556
- IsAntisymmetricBinaryRelation, R 308
- IsAssociated, R 556
- IsAssociative, R 316
- IsAssociativeElement, R 294
- IsAssociativeElementCollColl, R 294
- IsAssociativeElementCollection, R 294
- IsAssocWord, R 323
- IsAssocWordWithInverse, R 323
- IsAssocWordWithOne, R 323
- IsAttributeStoringRep, P 37
- IsAutomorphismGroup, R 382
- IsBasicWreathLessThanOrEqual, R 326
- IsBasicWreathProductOrdering, R 278
- IsBasis, R 587
- IsBasisByNiceBasis, R 598
- IsBasisOfAlgebraModuleElementSpace, R 620
- IsBergerCondition, R 807
- IsBijection, T 78
- IsBijective, R 299
- IsBinaryRelation, R 307
  - same as IsEndoGeneralMapping, R 307
- IsBLetterAssocWordRep, R 329
- IsBLetterWordsFamily, R 329
- IsBlist, R 204
- IsBlockMatrixRep, R 231
- IsBool, R 165
- IsBound, for lists, R 173
- IsBound and Unbind for Lists, *R 173*
- IsBound and Unbind for Records, *R 258*
- IsBoundElmWPObj, E 52
- IsBoundGlobal, R 44
- IsBrauerTable, R 713
- IsBravaisGroup, R 424
- IsBuiltFromAdditiveMagmaWithInverses, R 338
- IsBuiltFromGroup, R 338
- IsBuiltFromMagma, R 338
- IsBuiltFromMagmaWithInverses, R 338
- IsBuiltFromMagmaWithOne, R 338
- IsBuiltFromSemigroup, R 338
- IsCanonicalBasis, R 590
- IsCanonicalBasisFullMatrixModule, R 594
- IsCanonicalBasisFullRowModule, R 594
- IsCanonicalNiceMonomorphism, R 380
- IsCanonicalPcgs, R 432
- IsCentral, R 316
- IsChainTypeGroup, N 19
- IsChar, R 242
- IsCharacter, R 759
- IsCharacteristicSubgroup, R 343
- IsCharacterTable, R 713
- IsCharacterTableInProgress, R 713
- IsCharCollection, R 242
- IsClassFunction, R 750
- IsClassFusionOfNormalSubgroup, R 729
- IsClosedStream, R 96
- IsCochain, R 640
- IsCochainCollection, R 640
- IsCollection, R 260
- IsCollectionFamily, R 260
- IsCommutative, R 316
- IsCommutativeElement, R 294
- IsCommutativeElementCollColl, R 294
- IsCommutativeElementCollection, R 294
- IsComponentObjectRep, P 37
- IsCompositionMappingRep, R 297
- IsConfluent, R 336
  - for pc groups, R 446
- IsConjugacyClassSubgroupsByStabilizerRep, R 363
- IsConjugacyClassSubgroupsRep, R 363
- IsConjugate, R 351
- IsConjugatorAutomorphism, R 381
- IsConjugatorIsomorphism, R 381
- IsConstantRationalFunction, R 658
- IsConstantTimeAccessGeneralMapping, R 305
- IsConstantTimeAccessList, R 169
- IsContainedInSpan, R 592
- IsCopyable, R 111
- IsCyc, R 153
- IsCyclic, R 356
  - for character tables, R 720
- IsCyclicTom, R 697
- IsCyclotomic, R 153
- IsCyclotomicField, R 579
- IsCyclotomicMatrixGroup, R 423
- IsDenseList, R 168

- IsDiagonalMat, R 219
- IsDictionary, N 9
- IsDigitChar, R 246
- IsDirectoryPath, R 92
- IsDistributive, R 556
- IsDivisionRing, R 566
- IsDomain, R 284
- IsDoneIterator, R 271
- IsDoubleCoset, R 349
- IsDuplicateFree, R 188
- IsDuplicateFreeList, R 188
- IsDxLargeGroup, R 738
- IsElementaryAbelian, R 356
- IsElementOfFpMonoid, R 538
- IsElementOfFpSemigroup, R 538
- IsElementOfFreeMagmaRing, R 649
- IsElementOfFreeMagmaRingCollection, R 649
- IsElementOfFreeMagmaRingFamily, R 649
- IsElementOfMagmaRingModuloRelations, R 651
- IsElementOfMagmaRingModuloRelations-  
Collection, R 651
- IsElementOfMagmaRingModuloRelationsFamily,  
R 651
- IsElementOfMagmaRingModuloSpanOfZeroFamily,  
R 651
- IsEmpty, R 265
- IsEmptyString, R 245
- IsEndOfStream, R 99
- IsEndoGeneralMapping, R 305  
same as IsBinaryRelation, R 307
- IsEqualSet, R 191
- IsEquivalenceClass, R 310
- IsEquivalenceRelation, R 308
- IsEuclideanRing, R 558
- IsEvenInt, R 126
- IsExecutableFile, R 92
- IsExistingFile, R 92
- IsExtAElement, R 292
- IsExternalOrbit, R 400
- IsExternalSet, R 399
- IsExternalSubset, R 400
- IsExtLElement, R 292
- IsExtRElement, R 292
- IsFamilyPcgs, R 443
- IsFFE, R 572
- IsFFECollColl, R 572
- IsFFECollection, R 572
- IsField, R 566
- IsFieldControlledByGaloisGroup, R 569
- IsFieldHomomorphism, R 305
- IsFinite, R 265  
for character tables, R 720
- IsFiniteDimensional, R 564  
for matrix algebras, R 608
- IsFiniteFieldPolynomialRing, R 667
- IsFinitelyGeneratedGroup, R 357
- IsFiniteOrderElement, R 294
- IsFiniteOrderElementCollColl, R 294
- IsFiniteOrderElementCollection, R 294
- IsFiniteOrdersPcgs, R 428
- IsFixedStabilizer, R 416
- IsFLMLOR, R 607
- IsFLMLORWithOne, R 607
- IsFpGroup, R 454
- IsFpMonoid, R 538
- IsFpSemigroup, R 537
- IsFreeGroup, R 324
- IsFreeLeftModule, R 563
- IsFreeMagmaRing, R 649
- IsFreeMagmaRingWithOne, R 649
- IsFromFpGroupGeneralMappingByImages, R 386
- IsFromFpGroupHomomorphismByImages, R 386
- IsFromFpGroupStdGensGeneralMappingByImages,  
R 386
- IsFromFpGroupStdGensHomomorphismByImages,  
R 386
- IsFullHomModule, R 597
- IsFullMatrixModule, R 565
- IsFullRowModule, R 565
- IsFullSubgroupGLorSLRespectingBilinearForm,  
R 422
- IsFullSubgroupGLorSLRespectingQuadratic-  
Form, R 423
- IsFullSubgroupGLorSLRespectingSesquilinear-  
Form, R 422
- IsFullTransformationSemigroup, R 529
- IsFunc, T 78
- IsFunction, R 62
- IsGaussianIntegers, R 583
- IsGaussianRationals, R 578
- IsGaussianSpace, R 592
- IsGaussInt, R 156
- IsGaussRat, R 156
- IsGeneralizedDomain, R 284
- IsGeneralizedRowVector, R 179
- IsGeneralLinearGroup, R 421

- IsGeneralMapping, R 305
- IsGeneralMappingFamily, R 306
- IsGeneratorsOf *Struct*, R 281
- IsGL, R 421
- IsGreensClass, R 531
- IsGreensDClass, R 531
- IsGreensDRelation, R 530
- IsGreensHClass, R 531
- IsGreensHRelation, R 530
- IsGreensJClass, R 531
- IsGreensJRelation, R 530
- IsGreensLClass, R 531
- IsGreensLessThanOrEqual, R 531
- IsGreensLRelation, R 530
- IsGreensRClass, R 531
- IsGreensRelation, R 530
- IsGreensRRelation, R 530
- IsGroup, R 342
- IsGroupGeneralMapping, R 303
- IsGroupGeneralMappingByAsGroupGeneral-  
MappingByImages, R 385
- IsGroupGeneralMappingByImages, R 385
- IsGroupGeneralMappingByPcgs, R 386
- IsGroupHClass, R 532
- IsGroupHomomorphism, R 303
- IsGroupOfAutomorphisms, R 382
- IsGroupRing, R 649
- IsHandledByNiceBasis, R 565  
for vector spaces, R 598
- IsHandledByNiceMonomorphism, R 380
- IsHash, N 10
- IsHasseDiagram, R 308
- IsHomCoset, N 13
- IsHomCosetOfAdditiveElt, N 13
- IsHomCosetOfFp, N 13
- IsHomCosetOfMatrix, N 13
- IsHomCosetOfPerm, N 13
- IsHomCosetOfTuple, N 13
- IsHomCosetToAdditiveElt, N 13
- IsHomCosetToAdditiveEltRep, N 13
- IsHomCosetToFp, N 13
- IsHomCosetToFpRep, N 13
- IsHomCosetToMatrix, N 13
- IsHomCosetToMatrixRep, N 13
- IsHomCosetToObjectRep, N 13
- IsHomCosetToPerm, N 13
- IsHomCosetToPermRep, N 13
- IsHomCosetToTuple, N 13
- IsHomCosetToTupleRep, N 13
- IsHomogeneousList, R 169
- IsIdempotent, R 287
- IsIdenticalObj, R 110, T 24
- IsInChain, N 19
- IsIncomparableUnder, R 274
- IsInducedFromNormalSubgroup, R 809
- IsInducedPcgs, R 431
- IsInducedPcgsWrtSpecialPcgs, R 439
- IsInfBitsFamily, R 330
- IsInfinity, R 156
- IsInjective, R 298
- IsInnerAutomorphism, R 381
- IsInputOutputStream, R 103
- IsInputStream, R 96
- IsInputTextNone, R 96
- IsInputTextStream, R 96
- IsInt, R 125
- IsIntegerMatrixGroup, R 423
- IsIntegers, R 125
- IsIntegralBasis, R 590
- IsIntegralCyclotomic, R 154
- IsIntegralRing, R 555
- IsInternallyConsistent, R 114  
for character tables, R 728  
for tables of marks, R 697
- IsIrreducibleCharacter, R 759
- IsIrreducibleRingElement, R 557
- IsIterator, R 271
- IsJacobianElement, R 294
- IsJacobianElementCollColl, R 294
- IsJacobianElementCollection, R 294
- IsJacobianRing, R 556
- IsLaurentPolynomial, R 658
- IsLaurentPolynomialDefaultRep, R 674
- IsLDistributive, R 555
- IsLeftAlgebraModuleElement, R 619
- IsLeftAlgebraModuleElementCollection, R 619
- IsLeftIdeal, R 553
- IsLeftIdealInParent, R 553
- IsLeftModule, R 562
- IsLeftModuleGeneralMapping, R 304
- IsLeftModuleHomomorphism, R 304
- IsLeftOperatorAdditiveGroup, R 562
- IsLeftSemigroupIdeal, R 529
- IsLeftVectorSpace, R 584
- IsLessThanOrEqualUnder, R 274
- IsLessThanUnder, R 274

- IsLetterAssocWordRep, R 329
- IsLetterWordsFamily, R 329
- IsLexicographicallyLess, R 194
- IsLieAbelian, R 630
- IsLieAlgebra, R 607
- IsLieMatrix, R 216
- IsLieNilpotent, R 630
- IsLieObject, R 625
- IsLieObjectCollection, R 625
- IsLieSolvable, R 630
- IsLinearMapping, R 304
- IsLinearMappingsModule, R 597
- IsList, R 168
- IsListDefault, R 179
- IsListOrCollection, R 261
- IsLookupDictionary, N 9
- IsLowerAlphaChar, R 246
- IsLowerTriangularMat, R 219
- IsMagma, R 312
- IsMagmaHomomorphism, R 302
- IsMagmaRingModuloRelations, R 651
- IsMagmaRingModuloSpanOfZero, R 651
- IsMagmaWithInverses, R 312
- IsMagmaWithInversesIfNonzero, R 312
- IsMagmaWithOne, R 312
- IsMapping, R 298
- IsMat, T 78
- IsMatchingSublist, R 188
- IsMatrix, R 215
- IsMatrixGroup, R 420
- IsMatrixModule, R 565
- IsMatrixSpace, R 592
- IsMinimalNonmonomial, R 812
- IsModuloPcgs, R 433
- IsMonoid, R 534
- IsMonomial, for characters, R 809
  - for character tables, R 720
  - for groups, R 809
  - for positive integers, R 810
- IsMonomialGroup, R 357
- IsMonomialMatrix, R 219
- IsMonomialNumber, R 810
- IsMonomialOrdering, R 667
- IsMultiplicativeElement, R 292
- IsMultiplicativeElementWithInverse, R 293
- IsMultiplicativeElementWithOne, R 292
- IsMultiplicativeElementWithZero, R 292
- IsMultiplicativeGeneralizedRowVector, R 179
- IsMultiplicativeZero, R 316
- IsMutable, R 112
- IsMutableBasis, R 591
- IsNaturalAlternatingGroup, R 407
- IsNaturalGL, R 421
- IsNaturalGLnZ, R 423
- IsNaturalSL, R 422
- IsNaturalSLnZ, R 424
- IsNaturalSymmetricGroup, R 407
- IsNearAdditiveElement, R 292
- IsNearAdditiveElementWithInverse, R 292
- IsNearAdditiveElementWithZero, R 292
- IsNearAdditiveGroup, R 546
- IsNearAdditiveMagma, R 546
- IsNearAdditiveMagmaWithInverses, R 546
- IsNearAdditiveMagmaWithZero, R 546
- IsNearlyCharacterTable, R 713
- IsNearRingElement, R 293
- IsNearRingElementWithInverse, R 293
- IsNearRingElementWithOne, R 293
- IsNegRat, R 142
- IsNilpotent, for character tables, R 720
  - for groups with pcgs, R 441
- IsNilpotentElement, R 637
- IsNilpotentGroup, R 356
- IsNilpotentTom, R 697
- IsNonassocWord, R 319
- IsNonassocWordCollection, R 319
- IsNonassocWordWithOne, R 319
- IsNonassocWordWithOneCollection, R 319
- IsNonnegativeIntegers, R 125
- IsNonSPGeneralMapping, R 306
- IsNonTrivial, R 265
- IsNormal, R 343
- IsNormalBasis, R 590
- IsNotIdenticalObj, R 111
- IsNumberField, R 578
- IsObject, R 109
- IsOddInt, R 126
- isomorphic, pc group, R 447
- IsomorphicSubgroups, R 384
- IsomorphismFpAlgebra, R 616
- IsomorphismFpGroup, R 462
  - for subgroups of fp groups, R 465
- IsomorphismFpGroupByGenerators, R 463
- IsomorphismFpGroupByGeneratorsNC, R 463
- IsomorphismFpGroupByPcgs, R 445
- IsomorphismFpSemigroup, R 538

- IsomorphismGroups, R 383
- IsomorphismMatrixAlgebra, R 616
- IsomorphismPcGroup, R 447
- IsomorphismPermGroup, R 406
  - for Imf matrix groups, R 525
- IsomorphismPermGroupImfGroup, R 526
- IsomorphismReesMatrixSemigroup, R 533
- IsomorphismRefinedPcGroup, R 447
- IsomorphismRepStruct, R 282
- isomorphisms, find all, R 384
- IsomorphismSCAlgebra, R 617
- IsomorphismSimplifiedFpGroup, R 465
- IsomorphismSpecialPcGroup, R 448
- Isomorphisms vs. Isomorphic Structures, *T* 84
- IsomorphismTransformationSemigroup, R 529
- IsomorphismTypeInfoFiniteSimpleGroup, R 357
- IsOne, R 287
- IsOperation, R 62
- IsOrdering, R 273
- IsOrderingOnFamilyOfAssocWords, R 274
- IsOrdinaryMatrix, R 215
- IsOrdinaryTable, R 713
- IsOutputStream, R 96
- IsOutputTextNone, R 97
- IsOutputTextStream, R 96
- IsPadicExtensionNumber, R 680
- IsPadicExtensionNumberFamily, R 680
- IsParentPcgsFamilyPcgs, R 443
- IsPartialOrderBinaryRelation, R 308
- IsPcGroup, R 444
- IsPcGroupGeneralMappingByImages, R 386
- IsPcGroupHomomorphismByImages, R 386
- IsPcgs, R 427
- IsPcgsCentralSeries, R 435
- IsPcgsChiefSeries, R 436
- IsPcgsElementaryAbelianSeries, R 435
- IsPcgsPCentralSeriesPGroup, R 436
- IsPerfect, for character tables, R 720
- IsPerfectGroup, R 356
- IsPerfectTom, R 697
- IsPerm, R 402
- IsPermCollColl, R 402
- IsPermCollection, R 402
- IsPermGroup, R 406
- IsPermGroupGeneralMappingByImages, R 386
- IsPermGroupHomomorphismByImages, R 386
- IsPGroup, R 358
- IsPNilpotent, R 358
- IsPolycyclicGroup, R 356
- IsPolynomial, R 658
- IsPolynomialDefaultRep, R 674
- IsPolynomialFunction, R 657
- IsPolynomialFunctionsFamily, R 672
- IsPolynomialRing, R 666
- IsPosInt, R 125
- IsPositiveIntegers, R 125
- IsPosRat, R 141
- IsPreimagesByAsGroupGeneralMappingByImages, R 386
- IsPreOrderBinaryRelation, R 308
- IsPrime, R 557
- IsPrimeField, R 568
- IsPrimeInt, R 130
- IsPrimeOrdersPcgs, R 428
- IsPrimePowerInt, R 131
- IsPrimitive, R 397
- IsPrimitiveCharacter, R 808
- IsPrimitivePolynomial, R 659
- IsPrimitiveRootMod, R 136
- IsProbablyPrimeInt, R 130
- IsPseudoCanonicalBasisFullHomModule, R 597
- IsPSolvable, R 358
- IsPSolvableCharacterTable, R 729
- IsPSolvableCharacterTableOp, R 729
- IsPurePadicNumber, R 679
- IsPurePadicNumberFamily, R 679
- IsQuasiPrimitive, R 808
- IsQuaternion, R 608
- IsQuaternionCollColl, R 608
- IsQuaternionCollection, R 608
- IsQuickPositionList, R 203
- IsQuotientSemigroup, R 530
- IsRange, R 202
- IsRat, R 141
- IsRationalFunction, R 657
- IsRationalFunctionDefaultRep, R 673
- IsRationalFunctionsFamily, R 672
- IsRationalMatrixGroup, R 423
- IsRationals, R 141
- IsRationalsPolynomialRing, R 667
- IsRDistributive, R 556
- IsReadableFile, R 92
- IsReadOnlyGlobal, R 43
- IsRec, *T* 78
- IsRecord, R 254
- IsRecordCollColl, R 254

- IsRecordCollection, R 254
- IsReduced, R 337
- IsReductionOrdering, R 275
- IsReesCongruence, R 530
- IsReesCongruenceSemigroup, R 528
- IsReesMatrixSemigroup, R 532
- IsReesMatrixSemigroupElement, R 532
- IsReesZeroMatrixSemigroup, R 532
- IsReesZeroMatrixSemigroupElement, R 532
- IsReflexiveBinaryRelation, R 307
- IsRegular, R 397
- IsRegularDClass, R 532
- IsRegularSemigroup, R 528
- IsRegularSemigroupElement, R 528
- IsRelativelySM, R 811
- IsRestrictedLieAlgebra, R 635
- IsRewritingSystem, R 336
- IsRightAlgebraModuleElement, R 619
- IsRightAlgebraModuleElementCollection, R 619
- IsRightCoset, R 347
- IsRightIdeal, R 553
- IsRightIdealInParent, R 553
- IsRightModule, R 562
- IsRightOperatorAdditiveGroup, R 562
- IsRightSemigroupIdeal, R 529
- IsRing, R 550
- IsRingElement, R 293
- IsRingElementWithInverse, R 293
- IsRingElementWithOne, R 293
- IsRingGeneralMapping, R 305
- IsRingHomomorphism, R 305
- IsRingWithOne, R 554
- IsRingWithOneGeneralMapping, R 305
- IsRingWithOneHomomorphism, R 305
- IsRootSystem, R 631
- IsRootSystemFromLieAlgebra, R 632
- IsRowModule, R 565
- IsRowSpace, R 592
- IsRowVector, R 208
- IsScalar, R 293
- IsSemiEchelonized, R 593
- IsSemigroup, R 527
- IsSemigroupCongruence, R 529
- IsSemigroupIdeal, R 529
- IsSemiRegular, R 397
- IsSet, R 189, T 78
- IsShortLexLessThanOrEqual, R 326
- IsShortLexOrdering, R 276
- IsSimple, for character tables, R 720
- IsSimpleAlgebra, R 607
- IsSimpleGroup, R 357
- IsSimpleSemigroup, R 528
- IsSingleValued, R 298
- IsSL, R 421
- IsSolvable, for character tables, R 720
- IsSolvableGroup, R 356
- IsSolvableTom, R 697
- IsSortedList, R 188
- IsSpecialLinearGroup, R 421
- IsSpecialPcgs, R 438
- IsSPGeneralMapping, R 306
- IsSporadicSimple, for character tables, R 720
- IsSSortedList, R 189
- IsStandardGeneratorsOfGroup, R 702
- IsStraightLineProgElm, R 335
- IsStraightLineProgram, R 331
- IsStream, R 96
- IsString, R 242
- IsStringRep, R 245
- IsStruct, R 282
- IsSubgroup, R 343
- IsSubgroupFpGroup, R 454
- IsSubgroupOfWholeGroupByQuotientRep, R 466
- IsSubgroupSL, R 422
- IsSubmonoidFpMonoid, R 537
- IsSubnormal, R 344
- IsSubnormallyMonomial, R 811
- IsSubsemigroupFpSemigroup, R 537
- IsSubset, R 267
- IsSubsetBlist, R 205
- IsSubsetLocallyFiniteGroup, R 357
- IsSubsetSet, R 191
- IsSubspacesVectorSpace, R 585
- IsSubstruct, R 284
- IsSupersolvable, for character tables, R 720
  - for groups with pcgs, R 441
- IsSupersolvableGroup, R 356
- IsSurjective, R 299
- IsSyllableAssocWordRep, R 330
- IsSyllableWordsFamily, R 330
- IsSymmetricBinaryRelation, R 307
- IsSymmetricGroup, R 408
- IsTable, R 169
- IsTableOfMarks, R 693
- IsTableOfMarksWithGens, R 704
- IsToPcGroupGeneralMappingByImages, R 386

- IsToPcGroupHomomorphismByImages, R 386
  - IsToPermGroupGeneralMappingByImages, R 386
  - IsToPermGroupHomomorphismByImages, R 386
  - IsTotal, R 298
  - IsTotalOrdering, R 274
  - IsTransformation, R 543
  - IsTransformationCollection, R 543
  - IsTransformationMonoid, R 529
  - IsTransformationSemigroup, R 529
  - IsTransitive, for characters, R 762
    - for class functions, R 762
    - for group actions, R 396
  - IsTransitiveBinaryRelation, R 307
  - IsTranslationInvariantOrdering, R 274
  - IsTrivial, R 265
  - IsTuple, R 296
  - IsTwoSidedIdeal, R 553
  - IsTwoSidedIdealInParent, R 553
  - IsUEALatticeElement, R 643
  - IsUEALatticeElementCollection, R 643
  - IsUEALatticeElementFamily, R 643
  - IsUniqueFactorizationRing, R 555
  - IsUnit, R 556
  - IsUnivariatePolynomial, R 658
  - IsUnivariatePolynomialRing, R 667
  - IsUnivariateRationalFunction, R 658
  - IsUnknown, R 163
  - IsUpperAlphaChar, R 246
  - IsUpperTriangularMat, R 219
  - IsValidIdentifier, R 41
  - IsVector, R 293
  - IsVectorSpace, R 584
  - IsVirtualCharacter, R 759
  - IsWeightLexOrdering, R 277
  - IsWeightRepElement, R 644
  - IsWeightRepElementCollection, R 644
  - IsWeightRepElementFamily, R 644
  - IsWellFoundedOrdering, R 273
  - IsWeylGroup, R 633
  - IsWholeFamily, R 266
  - IsWLetterAssocWordRep, R 329
  - IsWLetterWordsFamily, R 329
  - IsWord, R 318
  - IsWordCollection, R 319
  - IsWordWithInverse, R 318
  - IsWordWithOne, R 318
  - IsWreathProductOrdering, R 278
  - IsWritableFile, R 92
  - IsZero, R 287
  - IsZeroGroup, R 528
  - IsZeroSimpleSemigroup, R 528
  - IsZeroSquaredElement, R 294
  - IsZeroSquaredElementCollColl, R 294
  - IsZeroSquaredElementCollection, R 294
  - IsZeroSquaredRing, R 556
  - IsZmodnZObj, R 133
  - IsZmodnZObjNonprime, R 133
  - IsZmodpZObj, R 133
  - IsZmodpZObjLarge, R 133
  - IsZmodpZObjSmall, R 133
  - Iterated, R 199
  - Iterator, R 270
  - IteratorByBasis, R 589
  - IteratorByFunctions, R 272
  - IteratorList, R 271
  - Iterators, *R 270*
  - IteratorSorted, R 271
- J**
- $j_N$ , R 158
  - Jacobi, R 136
  - JenningsLieAlgebra, R 636
  - JenningsSeries, R 361
  - JoinEquivalenceRelations, R 310
  - JoinStringsWithSeparator, R 248
  - JordanDecomposition, R 227
- K**
- $k_N$ , R 158
  - KappaPerp, R 637
  - KB\_REW, R 541
  - kernel, T 55
  - KernelOfAdditiveGeneralMapping, R 304
  - KernelOfCharacter, R 761
  - KernelOfMultiplicativeGeneralMapping, R 303
  - KernelOfTransformation, R 544
  - KeyDependentOperation, E 46
  - Key Dependent Operations, *E 46*
  - Keywords, *R 40*
  - KillingMatrix, R 637
  - KnownAttributesOfObject, R 120, T 75
  - Known Problems of the Configure Process, *R 820*
  - KnownPropertiesOfObject, R 123, T 75
  - KnownTruePropertiesOfObject, R 123, T 75
  - KnowsDictionary, N 9
  - KnowsHowToDecompose, R 374
  - KnuthBendixRewritingSystem, R 541

- Krasner-Kaloujnine theorem, R 498  
 KroneckerProduct, R 221  
 KuKGenerators, R 498  
**L**  
 $l_N$ , R 158  
 Labels and References, *E 15*  
 Lambda, R 134  
 Language Overview, *R 38*  
 larger or equal, R 46  
 larger test, R 46  
 LargestElementGroup, R 370  
 LargestElementStabChain, R 415  
 LargestMovedPoint, R 403  
 LargestUnknown, R 163  
 last, R 63, T 23  
 last2, T 23  
 last3, T 23  
 LastSystemError, R 89  
 LaTeXStringDecompositionMatrix, R 727  
 lattice base reduction, R 238  
 lattice basis reduction, for virtual characters, R 766  
 LatticeByCyclicExtension, R 367  
 LatticeGeneratorsInUEA, R 643  
 Lattice Reduction, *R 238*  
 LatticeSubgroups, R 365  
 LatticeSubgroupsByTom, R 690  
 LaurentPolynomialByCoefficients, R 664  
 LaurentPolynomialByExtRep, R 675  
 Laurent Polynomials, *R 664*  
 LClassOfHClass, R 531  
 Lcm, R 560  
 LcmInt, R 129  
 LcmOp, R 560  
 LeadCoeffsIGS, R 432  
 LeadingCoefficient, R 660  
 LeadingCoefficientOfPolynomial, R 668  
 LeadingExponentOfPcElement, R 429  
 LeadingMonomial, R 660  
 LeadingMonomialOfPolynomial, R 668  
 LeadingTermOfPolynomial, R 668  
 Leaving GAP, *R 71*  
 leaving GAP, T 18  
 LeftActingAlgebra, R 620  
 LeftActingDomain, R 563  
 LeftActingRingOfIdeal, R 554  
 LeftAlgebraModule, R 618  
 LeftAlgebraModuleByGenerators, R 617  
 left cosets, R 347  
 LeftDerivations, R 627  
 LeftIdeal, R 552  
 LeftIdealByGenerators, R 553  
 LeftIdealNC, R 553  
 LeftModuleByGenerators, R 563  
 LeftModuleByHomomorphismToMatAlg, R 621  
 LeftModuleGeneralMappingByImages, R 595  
 LeftModuleHomomorphismByImages, R 595  
 LeftModuleHomomorphismByImagesNC, R 595  
 LeftModuleHomomorphismByMatrix, R 596  
 LeftQuotient, R 289  
     for words, R 326  
 LeftShiftRowVector, R 212  
 legacy, R 832  
 Legendre, R 137  
 Length, R 189  
     of an associative word, R 327  
 length, of a word, R 327  
 LengthsTom, R 694  
 LengthWord, T 78  
 LengthWPObj, E 52  
 LenstraBase, R 581  
 LessThanFunction, R 274  
 LessThanOrEqualFunction, R 274  
 LetterRepAssocWord, R 330  
 LevelsOfGenerators, R 278  
 LeviMalcevDecomposition, R 613  
     for Lie algebras, R 631  
 Lexical Structure, *R 39*  
 LexicographicOrdering, R 275  
 LGFirst, R 439  
 LGLayers, R 438  
 LGLength, R 439  
 LGWeights, R 438  
 library tables, R 711  
 LieAlgebra, R 626  
 LieAlgebraByStructureConstants, R 626  
 LieBracket, R 289  
 LieCenter, R 628  
 LieCentralizer, R 628  
 LieCentre, R 628  
 LieCoboundaryOperator, R 641  
 LieDerivedSeries, R 629  
 LieDerivedSubalgebra, R 628  
 LieFamily, R 625  
 LieLowerCentralSeries, R 629  
 LieNilRadical, R 629

- LieNormalizer, R 628
- LieObject, R 625
- Lie objects, *R 625*
- LieSolvableRadical, R 629
- LieUpperCentralSeries, R 630
- LiftedInducedPcgs, R 434
- LiftedPcElement, R 434
- LinearAction, R 440
- LinearActionLayer, R 440
- LinearCharacters, R 719
- LinearCombination, R 589
- LinearCombinationPcgs, R 429
- Linear equations over the integers and Integral Matrices, *R 233*
- LinearIndependentColumns, R 237
- Linear Mappings, *R 304*
- LinearOperation, R 440
- LinearOperationLayer, R 440
- Line Editing, *R 72*
- line editing, T 20
- LinesOfStraightLineProgram, R 332
- List, R 196
- list and non-list, difference, R 181
  - left quotient, R 184
  - mod, R 183
  - product, R 182
  - quotient, R 183
- List Assignment, *R 171*
- list assignment, operation, R 170
- ListBlist, R 204
- list boundedness test, operation, R 170
- List Categories, *R 168*
- list element, access, R 170
  - assignment, R 171
  - operation, R 170
- List Elements, *R 170*
- list environment, compact description, E 21
  - description, E 20
  - ordered, E 21
  - unordered, E 21
- list equal, comparison, R 177
- ListN, R 199
- list of available books, R 23
- List Operations, *T 35*
- ListPerm, R 404
- lists, dense, T 28
  - strictly sorted, T 31
- lists, identical, *T 29*
  - plain, *T 27*
- Lists and Collections, *R 261*
- list smaller, comparison, R 178
- ListStabChain, R 415
- list unbind, operation, R 170
- ListWithIdenticalEntries, R 185
- ListX, R 200
- LLL, R 766
- LLL algorithm, for Gram matrices, R 239
  - for vectors, R 238
  - for virtual characters, R 766
- LLLReducedBasis, R 238
- LLLReducedGramMat, R 239
- LoadDynamicModule, R 35
- Loading a GAP Package, *R 828*
- loading a saved workspace, R 37
- loading source code from a file, T 19
- LoadPackage, R 828
- local, R 54
- Local Variables, *T 41*
- logarithm, discrete, R 135
  - of a root of unity, R 156
- LogFFE, R 574
- logical, R 165
- Logical Implications, *P 14*
- logical operations, R 166
- LogInt, R 127
- LogMod, R 135
- LogModShanks, R 135
- LogTo, R 94
  - for streams, R 101
  - stop logging, R 94
- LongestWeylWordPerm, R 634
- LookupDictionary, N 9
- loop, read eval print, R 63
- loop, for, R 51
  - repeat, R 51
  - while, R 50
- loop over iterator, R 53
- loop over object, R 53
- loop over range, R 52
- loops, leaving, R 53
  - restarting, R 54
- loops, for, *T 33*
  - while, *T 33*
- LowercaseString, R 247
- LowerCentralSeriesOfGroup, R 361
- Low Index Subgroups, *R 461*

- LowIndexSubgroupsFpGroup, R 461
- Low Level Access Functions for Weak Pointer Objects, *E 52*
- Low Level Routines to Modify and Create Stabilizer Chains, *R 415*
- Lucas, R 151
- M**
- $m_N$ , R 158
- Macintosh, R 823
- MacOS, R 823
- Magma, R 312
- MagmaByGenerators, R 313
- MagmaByMultiplicationTable, R 314
- Magma Categories, *R 312*
- MagmaElement, R 314
- Magma Generation, *R 312*
- MagmaHomomorphismByFunctionNC, R 302
- Magma Homomorphisms, *R 302*
- MagmaRingModuloSpanOfZero, R 651
- Magma Rings modulo Relations, *R 651*
- Magma Rings modulo the Span of a Zero Element, *R 651*
- Magnas Defined by Multiplication Tables, *R 314*
- MagmaWithInverses, R 313
- MagmaWithInversesByGenerators, R 313
- MagmaWithInversesByMultiplicationTable, R 314
- MagmaWithOne, R 312
- MagmaWithOneByGenerators, R 313
- MagmaWithOneByMultiplicationTable, R 314
- Main Loop, *R 63*
- MakeConfluent, R 337
- MakeHomChain, N 21
- MakeImmutable, R 112
- makeindex, E 26
- MakeReadOnlyGlobal, R 43
- MakeReadWriteGlobal, R 43
- Making transformation semigroups, *R 529*
- manual.bb1, E 26
- manual.bib, E 26
- manual.dvi, E 26
- manual.lab, E 26
- manual.mst, E 26
- manual.six, E 26
- manual.tex, E 26
- Manual Conventions, *R 20*
- manualindex, E 26
- map, parametrized, R 793
- MappedWord, R 320
- MappingByFunction, R 296
- MappingPermListList, R 405
- Mappings that Respect Addition, *R 303*
- Mappings that Respect Multiplication, *R 302*
- Mappings which are Compatible with Algebraic Structures, *R 302*
- maps, R 784
- maps-to operator, T 25
- MarksTom, R 693
- MatAlgebra, R 604
- MatClassMultCoeffsCharTable, R 731
- mathematics alignments, E 23
- mathematics displays, E 23
- MathieuGroup, R 501
- MatLieAlgebra, R 627
- matrices, T 36
  - commutator, R 217
- Matrices as Basis of a Row Space, *R 225*
- Matrices as Linear Mappings, *R 227*
- Matrices over Finite Fields, *R 228*
- Matrices Representing Linear Equations and the Gaussian Algorithm, *R 222*
- MatrixAlgebra, R 604
- MatrixAutomorphisms, R 745
- matrix automorphisms, R 787
- MatrixByBlockMatrix, R 232
- Matrix Constructions, *R 219*
- Matrix Groups in Characteristic 0, *R 423*
- MatrixLieAlgebra, R 627
- MatrixOfAction, R 620
- matrix spaces, R 592
- MatScalarProducts, R 760
- MatTom, R 696
- MaximalAbelianQuotient, R 363
- MaximalBlocks, R 398
- MaximalNormalSubgroups, R 364
- MaximalSubgroupClassReps, R 364
- MaximalSubgroups, R 364
  - for groups with pcgs, R 441
- MaximalSubgroupsLattice, R 365
- MaximalSubgroupsTom, R 700
- Maximum, R 195
- MaximumList, R 195
- MeatAxe Modules, *R 682*
- MeetEquivalenceRelations, R 310
- MeetMaps, R 796

- MeetPartitionStrat, E 59
- meet strategy, E 59
- Membership Test for Collections, *R 268*
- Membership Test for Lists, *R 177*
- method, P 11
- Method Installation, *P 11*
- methods, T 72
  - immediate, T 74
  - selection, T 73
  - true, T 74
- MinimalElementCosetStabChain, R 415
- MinimalGeneratingSet, R 370
  - for groups with pcgs, R 441
- MinimalNonmonomialGroup, R 812
- Minimal Nonmonomial Groups, *R 812*
- MinimalNormalSubgroups, R 365
- MinimalPolynomial, R 662
  - over a field, R 569
  - over a ring, R 662
- Minimal Polynomials, *R 662*
- MinimalStabChain, R 413
- MinimalSupergroupsLattice, R 366
- MinimalSupergroupsTom, R 700
- MinimizedBombieriNorm, R 664
- Minimum, R 195
- MinimumList, R 195
- MinusCharacter, R 802
- Miscellaneous, *R 139*
- Miscellaneous Name Changes or Removed Names, *R 833*
- mod, integers, R 133
  - laurent polynomials, R 656
  - lists, R 183
  - rationals, R 47
- mod, R 47
  - arithmetic operators, R 47
  - for character tables, R 717
  - residue class rings, R 132
- modulo, R 47
  - arithmetic operators, R 47
  - for pcgs, R 433
  - residue class rings, R 132
- ModuloPcgs, R 433
- MoebiusMu, R 139
- MoebiusTom, R 696
- Molien Series, *R 773*
- MolienSeries, R 773
- MolienSeriesInfo, R 774
- MolienSeriesWithGivenDenominator, R 775
- Monoid, R 534
- MonoidByGenerators, R 534
- MonoidByMultiplicationTable, R 535
- MonoidOfRewritingSystem, R 542
- MonomialComparisonFunction, R 668
- MonomialExtGrlxLess, R 670
- MonomialExtrepComparisonFun, R 668
- MonomialGrevlexOrdering, R 669
- MonomialGrlxOrdering, R 669
- MonomialLexOrdering, R 669
- Monomial Orderings, *R 667*
- MonomialTotalDegreeLess, R 833
- monomorphisms, find all, R 384
- MorClassLoop, R 384
- More about Boolean Lists, *R 206*
- More About Global Variables, *R 43*
- More about Tables of Marks, *R 688*
- MostFrequentGeneratorFpGroup, R 460
- MovedPoints, R 403
- Moved Points of Permutations, *R 403*
- MTX.BasesCompositionSeries, R 684
- MTX.BasesMaximalSubmodules, R 683
- MTX.BasesMinimalSubmodules, R 683
- MTX.BasesMinimalSupermodules, R 684
- MTX.BasesSubmodules, R 683
- MTX.BasisInOrbit, R 685
- MTX.BasisRadical, R 683
- MTX.BasisSocle, R 683
- MTX.CollectedExceptions, R 684
- MTX.CompositionFactors, R 684
- MTX.DegreeSplittingField, R 683
- MTX.Dimension, R 683
- MTX.Distinguish, R 685
- MTX.Field, R 683
- MTX.Generators, R 683
- MTX.Homomorphism, R 685
- MTX.Homomorphisms, R 685

- MTX.InducedAction, R 684
- MTX.InducedActionFactorMatrix, R 684
- MTX.InducedActionFactorModule, R 684
- MTX.InducedActionMatrix, R 684
- MTX.InducedActionMatrixNB, R 684
- MTX.InducedActionSubmodule, R 684
- MTX.InducedActionSubmoduleNB, R 684
- MTX.InvariantBilinearForm, R 685
- MTX.InvariantQuadraticForm, R 685
- MTX.InvariantSesquilinearForm, R 685
- MTX.IsAbsolutelyIrreducible, R 683
- MTX.IsEquivalent, R 684
- MTX.IsIrreducible, R 683
- MTX.Isomorphism, R 685
- MTX.NormedBasisAndBaseChange, R 684
- MTX.OrthogonalSign, R 685
- MTX.ProperSubmoduleBasis, R 683
- MTX.SubGModule, R 683
- MTX.SubmoduleGModule, R 683
- multiplication, R 47
  - matrices, R 217
  - matrix and matrix list, R 218
  - matrix and scalar, R 216
  - matrix and vector, R 217
  - operation, R 289
  - scalar and matrix, R 216
  - scalar and matrix list, R 217
  - scalar and vector, R 209
  - vector and matrix, R 216
  - vector and matrix list, R 218
  - vector and scalar, R 209
  - vectors, R 209
- MultiplicationTable, R 314
- Multiplicative Arithmetic for Lists, *R 182*
- Multiplicative Arithmetic Functions, *R 138*
- MultiplicativeNeutralElement, R 316
- multiplicative order of an integer, R 135
- MultiplicativeZero, R 316
- MultiplicativeZeroOp, R 286
- multiplicity, of constituents of a group character, R 760
- multiplier, R 373
- multisets, R 190
- Multivariate Polynomials, *R 661*
- MultRowVector, R 212
- Murnaghan components, R 772
- Mutability and Copyability, *R 111*
- Mutability and Copying, *P 29*
- Mutability Status and List Arithmetic, *R 184*
- Mutable Bases, *R 590*
- MutableBasis, R 591
- MutableBasisOfClosureUnderAction, R 610
- MutableBasisOfIdealInNonassociativeAlgebra, R 611
- MutableBasisOfNonassociativeAlgebra, R 611
- MutableIdentityMat, R 221
- MutableNullMat, R 221
- N**
- $n_k$ , R 158
- Name, R 114
- NameFunction, R 60
- NameRName, R 259
- NamesFilter, R 117
- NamesGVars, R 44
- NamesOfComponents, P 21
- NamesOfFusionSources, R 791
- NamesSystemGVars, R 44
- NamesUserGVars, R 44
- Naming Conventions, *T 79*
- NaturalCharacter, R 758
- Natural Embeddings related to Magma Rings, *R 650*
- NaturalHomomorphismByGenerators, R 302
- NaturalHomomorphismByIdeal, R 615
- NaturalHomomorphismByNormalSubgroup, R 362
- NaturalHomomorphismByNormalSubgroupNC, R 362
- NaturalHomomorphismBySubAlgebraModule, R 622
- NaturalHomomorphismBySubspace, R 596
- NearAdditiveGroup, R 547
- NearAdditiveGroupByGenerators, R 547
- NearAdditiveMagma, R 547
- NearAdditiveMagmaByGenerators, R 547
- NearAdditiveMagmaWithZero, R 547
- NearAdditiveMagmaWithZeroByGenerators, R 547
- NearlyCharacterTablesFamily, R 715
- negative number, R 47
- NegativeRoots, R 632
- NegativeRootVectors, R 632
- NestingDepthA, R 180
- NestingDepthM, R 180
- New Arithmetic Operations vs. New Objects, *P 63*
- NewAttribute, P 17
  - example, P 37
  - mutable, P 17
- NewCategory, P 16
- NewDictionary, N 9

- NewFamily, P 19
- NewFilter, P 18
- NewInfoClass, R 78
- newline, R 39
- newline character, R 244
- NewmanInfinityCriterion, R 470
- NewOperation, P 18
- New Presentations and Presentations for Subgroups, R 465
- NewProperty, P 17
- NewRepresentation, P 16
  - example, P 37
- NewType, P 20
- NextIterator, R 271
- NextPrimeInt, R 131
- NF, R 577
- NiceBasis, R 598
- NiceBasisFiltersInfo, R 599
- NiceFreeLeftModule, R 597
- NiceFreeLeftModuleInfo, R 598
- NiceMonomorphism, R 380
- NiceMonomorphismAutomGroup, R 383
- Nice Monomorphisms, R 379, T 56
- NiceObject, R 380
- NiceVector, R 597
- NilpotencyClassOfGroup, R 356
- NilpotentQuotientOfFpLieAlgebra, R 639
- NK, R 158
- NOAUTO, R 829
- NOfCyc, T 78
- NonnegativeIntegers, R 125
- NonnegIntScalarProducts, R 798
- NonNilpotentElement, R 637
- Norm, R 569
  - of character, R 760
- NormalBase, R 570
- NormalClosure, R 352
- NormalFormIntMat, R 236
- Normal Forms of Integer Matrices - Name Changes, R 832
- Normal Forms over the Integers, R 234
- NormalIntersection, R 352
- NormalizedElementOfMagmaRingModulo-Relations, R 651
- NormalizedWhitespace, R 248
- Normalizer, R 351
- normalizer, R 351
- NormalizerInGLnZ, R 424
- NormalizerInGLnZBravaisGroup, R 424
- NormalizersTom, R 698
- NormalizerTom, R 698
- NormalizeWhitespace, R 248
- NormalSeriesByPcgs, R 437
- Normal Structure, R 351
- NormalSubgroupClasses, R 748
- NormalSubgroupClassesInfo, R 747
- NormalSubgroups, R 364
- NormedRowVector, R 210
- NormedRowVectors, R 594
- NormedVectors, R 833
- not, R 167
- Notions of Generation, T 69
- NrArrangements, R 145
- NrBasisVectors, R 591
- NrCombinations, R 145
- NrConjugacyClasses, R 350
  - for character tables, R 720
- NrConjugacyClassesGL, R 505
- NrConjugacyClassesGU, R 505
- NrConjugacyClassesPGL, R 505
- NrConjugacyClassesPGU, R 505
- NrConjugacyClassesPSL, R 505
- NrConjugacyClassesPSU, R 505
- NrConjugacyClassesSL, R 505
- NrConjugacyClassesSLIsogeneous, R 505
- NrConjugacyClassesSU, R 505
- NrConjugacyClassesSUIsogeneous, R 505
- NrDerangements, R 148
- NrInputsOfStraightLineProgram, R 332
- NrMovedPoints, R 403
- NrOrderedPartitions, R 149
- NrPartitions, R 149
- NrPartitionsSet, R 148
- NrPartitionTuples, R 151
- NrPermutationsList, R 147
- NrPolyhedralSubgroups, R 730
- NrPrimitiveGroups, R 516
- NrRestrictedPartitions, R 150
- NrSubsTom, R 694
- NrTransitiveGroups, R 507
- NrTuples, R 147
- NrUnorderedTuples, R 146
- NullAlgebra, R 604
- NullMat, R 219
- NullspaceIntMat, R 233
- NullspaceMat, R 222

- NullspaceMatDestructive, R 222
- NullspaceModQ, R 231
- Number, R 197
- number, Bell, R 144
  - binomial, R 143
  - Stirling, of the first kind, R 144
  - Stirling, of the second kind, R 145
- NumberArgumentsFunction, R 60
- NumberFFVector, R 211
- number field, R 578
- number fields, Galois group, R 581
- NumberIrreducibleSolvableGroups, R 518
- NumberPerfectGroups, R 512
- NumberPerfectLibraryGroups, R 512
- NumberSmallGroups, R 509
- NumberSyllables, R 328
- Numerator, T 78
- numerator, of a rational, R 142
- NumeratorOfModuloPcgs, R 433
- NumeratorOfRationalFunction, R 657
- NumeratorRat, R 142
- Numerical Group Attributes, *R 358*
- O**
- 0, Operation mark-up, E 16
- $O_p(G)$ , see PCore, R 351
- ObjByExtRep, P 29, R 644
- Objectify, P 20
- ObjectifyWithAttributes, P 20
- Objects, *R 109*
- objects, T 22
- objects, vs. elements, *T 24*
  - vs. variables, *T 22*
- obsolete, R 832
- OCOneCocycles, R 372
- octal character codes, R 244
- OctaveAlgebra, R 604
- od, R 51
- OldGeneratorsOfPresentation, R 487
- Omega, R 355
- ONanScottType, R 408
- OnBreak, R 67
- OnBreakMessage, R 68
- One, N 17, R 285
- OneAttr, R 285
- OneCoboundaries, R 371
- OneCocycles, R 370
- one cohomology, R 370
- OneFactorBound, R 664
- OneImmutable, R 285
- OneIrreducibleSolvableGroup, R 518
- OneLibraryGroup, R 507
- OneMutable, R 285
- OneOfPcgs, R 428
- OneOp, R 285
- OnePrimitiveGroup, R 507
- OneSameMutability, R 285
- OneSM, R 285
- OneSmallGroup, R 509
- OneTransitiveGroup, R 507
- OnIndeterminates, R 662
  - as a permutation action, R 389
- OnLeftInverse, R 388
- OnLines, R 389
  - example, R 502
- OnPairs, R 388
- OnPoints, R 388
- OnRight, R 388
- OnSets, R 388
- OnSetsDisjointSets, R 388
- OnSetsSets, R 388
- OnSetsTuples, R 388
- OnSubspacesByCanonicalBasis, R 390
- OnTuples, R 388
- OnTuplesSets, R 388
- OnTuplesTuples, R 389
- Operation, R 832
- operation, P 11
- OperationAlgebraHomomorphism, R 616
- Operational Structure of Domains, *R 279*
- Operation Functions, *E 48*
- OperationHomomorphism, R 832
- operations, T 75
  - for booleans, R 166
- Operations and Attributes for Vector Spaces, *R 585*
- Operations and Mathematical Terms, *P 14*
- Operations and Methods, *P 11*
- Operations applicable to All Streams, *R 97*
- Operations Concerning Blocks, *R 725*
- Operations for (Near-)Additive Magmas, *R 548*
- Operations for Abelian Number Fields, *R 578*
- operations for algebraic elements, R 677
- Operations for Associative Words, *R 326*
- Operations for Associative Words by their Syllables, *R 328*
- Operations for Booleans, *R 166*

- Operations for Brauer Characters, *R 781*
- Operations for Class Functions, *R 759*
- Operations for Collections, *R 267*
- Operations for Cyclotomics, *R 153*
- Operations for Domains, *R 284*
- Operations for Finite Field Elements, *R 573*
- Operations for Finitely Presented Groups, *R 456*
- Operations for Group Homomorphisms, *R 377*
- Operations for Input Streams, *R 97*
- Operations for Lists, *R 192*
- Operations for Output Streams, *R 100*
- Operations for Pc Groups, *R 448*
- Operations for Rational Functions, *R 656*
- Operations for Special Kinds of Bases, *R 590*
- Operations for Stabilizer Chains, *R 414*
- Operations for Vector Space Bases, *R 588*
- Operations for Words, *R 320*
- Operations on elements of the algebra, *R 337*
- Operations on hom cosets, *N 14*
- Operations on rewriting systems, *R 336*
- Operations Records, *T 81*
- Operations to Evaluate Strings, *R 250*
- Operations to Produce or Manipulate Strings, *R 247*
- Operations vs. Dispatcher Functions, *T 82*
- Operations which have Special Methods for Groups with Pcps, *R 441*
- operators, *R 41*, *T 20*
  - arithmetic, *R 47*
  - associativity, *R 48*
  - for cyclotomics, *R 157*
  - for lists, *R 178*
  - precedence, *R 48*
- Operators for Character Tables, *R 717*
- Operators for Matrices, *R 216*
- Operators for Row Vectors, *R 208*
- Optimization and Compiler Options, *R 821*
- options, *R 813*
  - command line, filenames, *R 29*
  - command line, internal, *R 30*
- options, under UNIX, *R 27*
- or, *R 166*
- Orbit, *R 390*, *T 77*
- OrbitFusions, *R 792*
- OrbitGenerators, *N 16*
- OrbitGeneratorsInv, *N 16*
- OrbitGeneratorsOfGroup, *N 20*
- OrbitishF0, *E 49*
- OrbitLength, *R 391*
- OrbitLengths, *R 391*
- OrbitLengthsDomain, *R 391*
- OrbitPerms, *R 406*
- OrbitPowerMaps, *R 787*
- Orbits, *E 48*
  - operation/attribute, *R 390*
- Orbits, *R 390*
- OrbitsDomain, *R 390*
- OrbitsishOperation, *E 48*
- OrbitsPerms, *R 406*
- OrbitStabChain, *R 415*
- OrbitStabilizer, *R 391*
- OrbitStabilizerAlgorithm, *R 392*
- Orbit Stabilizer Methods for Polycyclic Groups, *R 440*
- Order, *R 288*, *T 78*
  - of a class function, *R 756*
- order, of a group, *R 341*
  - of a list, collection or domain, *R 266*
  - of the prime residue group, *R 134*
- OrderedPartitions, *R 149*
- ordered partitions, *E 55*
- ordering, booleans, *R 165*
  - of records, *R 257*
- OrderingByLessThanFunctionNC, *R 273*
- OrderingByLessThanOrEqualFunctionNC, *R 273*
- OrderingOfRewritingSystem, *R 336*
- OrderingOnGenerators, *R 275*
- OrderingsFamily, *R 273*
- Orderings on families of associative words, *R 274*
- OrderMod, *R 135*
- OrderOfRewritingSystem, *R 336*
- OrdersClassRepresentatives, *R 721*
- OrdersTom, *R 694*
- Ordinal, *R 251*
- ordinary character, *R 759*
- OrdinaryCharacterTable, *R 719*
- OrthogonalComponents, *R 772*
- Orthogonal Embeddings, *R 239*
- OrthogonalEmbeddings, *R 239*
- OrthogonalEmbeddingsSpecialDimension, *R 768*
- OSX, *R 822*
- Other Filters, *R 124*
- Other Operations Applicable to any Object, *R 114*
- Other Operations for Character Tables, *R 728*
- Other Operations for Tables of Marks, *R 697*
- output, suppressing, *R 63*
- OutputLogTo, *R 94*

- for streams, R 101
- stop logging output, R 94
- OutputTextFile, R 102
- OutputTextNone, R 105
- OutputTextString, R 103
- OutputTextUser, R 103
- overload, P 14
- P**
- P, Property mark-up, E 16
- $p$ -group, R 358
- package, R 828
- Package Completion, E 39
- Package Interface - Obsolete Functions and Name Changes, R 832
- Packages, R 817
- PadicCoefficients, R 238
- PadicExtensionNumberFamily, R 680
- PadicNumber, R 680
  - for pure padics, R 679
- Pager, R 25
- Parametrized, R 795
- Parametrized Maps, R 793
- parametrized maps, R 784
- Parent, R 283
- ParentPcgs, R 431
- Parents, R 283
- Parents and Subgroups, T 82
- Partial Methods, P 12
- partial order, R 308
- PartialOrderByOrderingFunction, R 309
- PartialOrderOfHasseDiagram, R 308
- Partitions, R 149
- partitions, improper, of an integer, R 149
  - ordered, of an integer, R 149
  - restricted, of an integer, R 150
- PartitionsGreatestEQ, R 150
- PartitionsGreatestLE, R 150
- PartitionsSet, R 148
- PartitionTuples, R 151
- PcElementByExponents, R 429
- PcElementByExponentsNC, R 429
- PCentralLieAlgebra, R 636
- PCentralNormalSeriesByPcgsPGroup, R 436
- PCentralSeries, R 361
- PcGroupCode, R 451
- PcGroupCodeRec, R 451
- PcGroupFpGroup, R 445
- Pc groups versus fp groups, R 444
- PcGroupWithPcgs, R 447
- Pcgs, R 427
- Pcgs\_OrbitStabilizer, R 441
- Pcgs and Normal Series, R 434
- PcgsByPcSequence, R 427
- PcgsByPcSequenceNC, R 427
- PcgsCentralSeries, R 435
- PcgsChiefSeries, R 436
- PcgsElementaryAbelianSeries, R 435
- PcgsPCentralSeriesPGroup, R 436
- PClassPGroup, R 358
- PCore, R 351
- PcSeries, R 428
- PerfectGroup, R 511
- perfect groups, R 511
- PerfectIdentification, R 512
- PerfectResiduum, R 353
- Perform, R 194
- Permanent, R 152
- Permanent of a Matrix, R 152
- PermBounds, R 781
- PermCharInfo, R 776
- PermCharInfoRelative, R 777
- PermChars, R 777
- PermCharsTom, R 707
- PermComb, R 781
- PermGroupOps.ElementProperty, T 78
- PermLeftQuoTransformation, R 545
- PermList, R 404
- PermListList, R 194
- Permutation, R 396
- PermutationCharacter, R 758
- permutation character, R 803
- permutation characters, possible, R 777
- PermutationCycle, R 396
- Permutation groups, T 44
- PermutationMat, R 220
- PermutationsFamily, R 402
- Permutations Induced by Elements and Cycles, R 396
- PermutationsList, R 147
- PermutationTom, R 692
- Permuted, R 196
  - as a permutation action, R 389
  - for class functions, R 756
- PGL, R 503
- PGU, R 504

- Phi, R 134
- Plain Lists, *T 27*
- Plain Records, *T 38*
- point stabilizer, R 391
- Polycyclic Generating Systems, *R 426*
- PolynomialByExtRep, R 674
- PolynomialCoefficientsOfPolynomial, R 660
- PolynomialDivisionAlgorithm, R 670
- Polynomial Factorization, *R 662*
- PolynomialModP, R 663
- PolynomialReducedRemainder, R 670
- PolynomialReduction, R 670
- PolynomialRing, R 665
- Polynomial Rings, *R 665*
- Polynomials, *T 84*
- Polynomials as Univariate Polynomials in one Indeterminate, *R 660*
- polynomials over abelian number fields, factors, R 578
- Polynomials over the Rationals, *R 663*
- PopOptions, R 87
- Portability, *R 89*
- Porting GAP, *R 821*
- Position, R 185, *T 78*
- Positional Objects, *P 22*
- PositionBound, R 187
- PositionCanonical, R 185
- PositionNonZero, R 187
- PositionNot, R 187
- PositionNthOccurrence, R 186
- PositionProperty, R 187
- PositionSet, R 186
- PositionSorted, R 186
- PositionStream, R 99
- PositionSublist, R 188
- Position vs. PositionCanonical, *T 49*
- PositionWord, R 327
- PositiveIntegers, R 125
- positive number, R 47
- PositiveRoots, R 632
- PositiveRootVectors, R 632
- PossibleClassFusions, R 791
- PossibleFusionsCharTableTom, R 706
- Possible Permutation Characters, *R 775*
- possible permutation characters, R 775
- PossiblePowerMaps, R 785
- power, R 47
  - matrix, R 217
  - meaning for class functions, R 755
  - of words, R 326
- PowerMap, R 785
- PowerMapByComposition, R 787
- PowerMapOp, R 785
- Power Maps, *R 784*
- PowerMapsAllowedBySymmetrizations, R 802
- PowerMod, R 560
- PowerModCoeffs, R 214
- PowerModInt, R 130
- PowerPartition, R 151
- powerset, R 145
- PowerSubalgebraSeries, R 609
- PQuotient, R 467
- precedence, R 47
- precedence test, for permutations, R 403
- PreferredGenerators, N 17
- PrefrattiniSubgroup, R 353
  - for groups with pcgs, R 441
- PreImage, R 301
- PreImageElm, R 300
- PreImages, R 301
- PreImagesElm, R 300
- Preimages in the Free Group, *R 455*
- Preimages in the Free Semigroup, *R 539*
- PreimagesOfTransformation, R 544
- PreImagesRange, R 300
- PreImagesRepresentative, R 301
- PreImagesSet, R 301
- Preimages under Homomorphisms from an FpGroup, *R 466*
- Preimages under Mappings, *R 300*
- preorder, R 308
- PresentationFpGroup, R 471
- PresentationNormalClosure, R 476
- PresentationNormalClosureRrs, R 476
- PresentationSubgroup, R 473
- PresentationSubgroupMtc, R 475
- PresentationSubgroupRrs, R 474
- PresentationViaCosetTable, R 472
- previous result, R 63
- PrevPrimeInt, R 131
- PrimaryGeneratorWords, R 475
- primary subgroup generators, R 489
- PrimeBlocks, R 725
- PrimeBlocksOp, R 725
- PrimeField, R 568
- Prime Integers and Factorization, *R 130*

- PrimePGroup, R 358
- PrimePowersInt, R 132
- prime residue group, R 134
  - exponent, R 134
  - generator, R 136
  - order, R 134
- Prime Residues, *R 134*
- PrimeResidues, function, R 134
- Primes, R 130
- primitive, R 397
- PRIMITIVE\_INDICES\_MAGMA, R 517
- PrimitiveElement, R 568
- PrimitiveGroup, R 516
- Primitive Groups, *R 408*
- PrimitiveGroupsIterator, R 516
- PrimitiveIdentification, R 517
- PrimitiveIndexIrreducibleSolvableGroup, R 518
- Primitive Permutation Groups, *R 515*
- PrimitivePolynomial, R 663
- PrimitiveRoot, R 575
- PrimitiveRootMod, R 136
- primitive root modulo an integer, R 136
- Primitive Roots and Discrete Logarithms, *R 135*
- Primitivity of Characters, *R 807*
- Print, R 64, T 78
- PrintAmbiguity, R 798
- PrintArray, R 221
- PrintCharacterTable, R 733
- PrintFactorsInt, R 132
- PrintFormattingStatus, R 101
- PrintHashWithNames, N 10
- Printing Character Tables, *R 731*
- Printing Class Functions, *R 756*
- Printing Presentations, *R 477*
- Printing Tables of Marks, *R 690*
- PrintObj, R 65
  - for character tables, R 731
  - for tables of marks, R 691
- PrintTo, R 94, T 78
  - for streams, R 100
- ProbabilityShapes, R 663
- problems, R 818
- Problems on Particular Systems, *R 821*
- procedure call, R 49
- Procedure Calls, *R 49*
- procedure call with arguments, R 49
- Process, R 107
- Process, *R 107*
- PROD\_GF2MAT\_GF2MAT\_ADVANCED, R 231
- PROD\_GF2MAT\_GF2MAT\_SIMPLE, R 231
- Producing a Manual, *E 26*
- Product, R 198
- product, of words, R 326
  - rational functions, R 656
- ProductCoeffs, R 213
- ProductSpace, R 609
- ProductX, R 201
- ProfileFunctions, R 81
- ProfileGlobalFunctions, R 81
- ProfileMethods, R 81
- ProfileOperations, R 80
- ProfileOperationsAndMethods, R 80
- PROFILETHRESHOLD, R 81
- Profiling, *R 80*
- ProjectedInducedPcgs, R 434
- ProjectedPcElement, R 434
- Projection, N 18, R 298
  - example for direct products, R 494
  - example for semidirect products, R 496
  - example for subdirect products, R 496
  - example for wreath products, R 497
  - for group products, R 498
- ProjectionMap, R 794
- projections, find all, R 384
- ProjectiveActionHomomorphismMatrixGroup, R 421
- ProjectiveActionOnFullSpace, R 421
- ProjectiveGeneralLinearGroup, R 503
- ProjectiveGeneralUnitaryGroup, R 504
- ProjectiveOrder, R 230
- ProjectiveSpecialLinearGroup, R 504
- ProjectiveSpecialUnitaryGroup, R 504
- ProjectiveSymplecticGroup, R 504
- prompt, R 63
  - partial, R 63
- Properties, *R 123*
- Properties and Attributes for Lists, *R 188*
- Properties and Attributes of (General) Mappings, *R 298*
- Properties and Attributes of Binary Relations, *R 307*
- Properties and Attributes of Matrices, *R 218*
- Properties and Attributes of Rational Functions, *R 657*
- Properties and basic functionality, *R 273*
- Properties and Filters, *T 73*

Properties of a Lie Algebra, *R 630*  
 Properties of rewriting systems, *R 337*  
 Properties of Rings, *R 555*  
 Properties of Tables of Marks, *R 696*  
 PRump, *R 354*  
 PseudoRandom, *R 269*  
 PSL, *R 504*  
 PSP, *R 504*  
 PSp, *R 504*  
 PSU, *R 504*  
 PthPowerImage, *R 636*  
 PthPowerImages, *R 635*  
 Pure p-adic Numbers, *R 679*  
 PurePadicNumberFamily, *R 679*  
 PushOptions, *R 87*

## Q

Quadratic, *R 160*  
 quadratic residue, *R 136*  
 QuaternionAlgebra, *R 604*  
 QUIET, *R 833*  
 QUIT, emergency quit, *R 71*  
 quit, in emergency, *R 71*  
 quit, *R 66, T 18*  
 QUITTING, *R 71*  
 QuoInt, *R 128*  
 Quotient, *R 551*  
 quotient, for finitely presented groups, *R 454*  
   matrices, *R 217*  
   matrix and matrix list, *R 218*  
   matrix and scalar, *R 217*  
   of free monoid, *R 540*  
   of free semigroup, *R 538*  
   of words, *R 326*  
   rational functions, *R 656*  
   scalar and matrix, *R 217*  
   scalar and matrix list, *R 217*  
   vector and matrix, *R 217*  
 QuotientFromSCTable, *R 603*  
 QuotientGroup, *N 17*  
 QuotientGroupByChainHomomorphicImage, *N 20*  
 QuotientGroupByHomomorphism, *N 14*  
 QuotientGroupByImages, *N 14*  
 QuotientGroupByImagesNC, *N 14*  
 QuotientGroupHom, *N 14*  
 Quotient Methods, *R 466*  
 QuotientMod, *R 560*  
 QuotientPolynomialsExtRep, *R 675*

QuotientRemainder, *R 559*  
 Quotients, *R 530*  
 Quotients and Remainders, *R 128*  
 QuotientSemigroupCongruence, *R 530*  
 QuotientSemigroupHomomorphism, *R 530*  
 QuotientSemigroupPreimage, *R 530*  
 QuotRemLaurpols, *R 665*

## R

R, Representation mark-up, *E 16*  
 $r_N$ , *R 158*  
 RadicalGroup, *R 353*  
 RadicalOfAlgebra, *R 612*  
 Random, *R 269*  
   for integers, *R 127*  
   for rationals, *R 142*  
 RandomBinaryRelationOnPoints, *R 309*  
 random element, of a list or collection, *R 269*  
 RandomElements, *R 269*  
 RandomHashKey, *N 10*  
 RandomInvertableMat, *T 78*  
 RandomInvertibleMat, *R 221*  
 RandomIsomorphismTest, *R 452*  
 Random Isomorphism Testing, *R 452*  
 Randomized Methods for Permutation Groups,  
   *R 410*  
 RandomList, *R 270*  
 RandomMat, *R 221*  
 Random Matrices, *R 221*  
 RandomSchreierSims, *N 20*  
 random seed, *R 270*  
 RandomTransformation, *R 543*  
 RandomUnimodularMat, *R 221*  
 Range, *N 14, R 299*  
 range, *R 201*  
 Ranges, *R 201, T 32*  
 RankAction, *R 397*  
 RankFilter, *R 116*  
 RankMat, *R 222*  
 RankOfTransformation, *R 544*  
 RankPGroup, *R 358*  
 Rat, *R 142*  
   for strings, *R 250*  
 RationalClass, *R 350*  
 RationalClasses, *R 351*  
 RationalFunctionByExtRep, *R 674*  
 RationalFunctionByExtRepWithCancellation,  
   *R 675*

- Rational Function Families, *R 672*
- RationalFunctionsFamily, *R 672*
- RationalizedMat, *R 161*
- Rationals, *R 141*
- RClassOfHClass, *R 531*
- Read, *R 93*, *T 19*
  - for streams, *R 97*
- read.g, for a GAP package, *E 37*
- ReadAll, *R 99*
- ReadAllLine, *R 104*
- ReadAsFunction, *R 93*
  - for streams, *R 98*
- ReadByte, *R 98*
- read eval print loop, *R 63*
- read evaluate print loop, *T 19*
- reading source code from a file, *T 19*
- ReadLine, *R 98*
- README, for a GAP package, *E 35*
- ReadPackage, *R 829*
- ReadPkg, *R 832*
- ReadTest, *R 83*
  - for streams, *R 98*
- RealClasses, *R 723*
- RealizableBrauerCharacters, *R 782*
- RecFields, *T 78*
- RecNames, *R 254*
- Recognizing Characters, *R 246*
- record, component access, *R 254*
  - component assignment, *R 255*
  - component variable, *R 255*
  - component variable assignment, *R 256*
- Record Access Operations, *R 259*
- Record Assignment, *R 255*
- record assignment, operation, *R 259*
- record boundness test, operation, *R 259*
- record component, operation, *R 259*
- record unbind, operation, *R 259*
- Recovery from NoMethodFound-Errors, *R 75*
- Recursion, *T 42*
- recursion, *R 54*
- Redispatching, *P 13*
- RedispatchOnCondition, *P 13*
- redisplay a help section, *R 23*
- redisplay with next help viewer, *R 23*
- ReduceCoeffs, *R 214*
- ReduceCoeffsMod, *R 214*
- ReducedAdditiveInverse, *R 337*
- ReducedCharacters, *R 765*
- ReducedClassFunctions, *R 765*
- ReducedComm, *R 337*
- ReducedConfluentRewritingSystem, *R 540*
- ReducedConjugate, *R 337*
- ReducedDifference, *R 337*
- ReducedForm, *R 336*
- ReducedGroebnerBasis, *R 671*
- ReducedInverse, *R 337*
- ReducedLeftQuotient, *R 337*
- ReducedOne, *R 337*
- ReducedPcElement, *R 429*
- ReducedPower, *R 337*
- ReducedProduct, *R 337*
- ReducedQuotient, *R 337*
- ReducedScalarProduct, *R 337*
- ReducedSum, *R 337*
- ReducedZero, *R 337*
- ReduceRules, *R 337*
- ReduceStabChain, *R 416*
- Reducing Virtual Characters, *R 765*
- Ree, *R 501*
- ReeGroup, *R 501*
- ReesCongruenceOfSemigroupIdeal, *R 529*
- ReesMatrixSemigroup, *R 532*
- ReesMatrixSemigroupElement, *R 532*
- Rees Matrix Semigroups, *R 532*
- ReesZeroMatrixSemigroup, *R 532*
- ReesZeroMatrixSemigroupElement, *R 532*
- ReesZeroMatrixSemigroupElementIsZero, *R 533*
- reference to a label, *E 15*
- RefinedPcGroup, *R 447*
- ReflectionMat, *R 221*
- ReflexiveClosureBinaryRelation, *R 309*
- reflexive relation, *R 307*
- regular, *R 397*
- regular action, *R 394*
- RegularActionHomomorphism, *R 395*
- RegularModule, *R 736*
- relations, *R 296*
- Relations Between Domains, *R 289*
- RelationsOfFpSemigroup, *R 539*
- RelativeBasis, *R 588*
- RelativeBasisNC, *R 588*
- relatively prime, *R 47*
- RelativeOrderOfPcElement, *R 428*
- RelativeOrders, of a pcgs, *R 428*
- Relators in a Presentation, *R 476*
- RelatorsOfFpGroup, *R 455*

- remainder, operation, R 289
- remainder of a quotient, R 128
- RemInt, R 128
- remove, an element from a set, R 192
- RemoveFile, R 94
- RemoveOuterCoeffs, R 212
- RemoveRelator, R 479
- RemoveSet, R 192
- RemoveStabChain, R 416
- Repeat, R 51
- repeat loop, R 51
- ReplacedString, R 248
- Representation, R 119
- representation, as a sum of two squares, R 139
- Representations for Associative Words, R 329
- Representations for Group Homomorphisms, R 385
- Representations given by modules, R 736
- Representations of Algebras, R 617
- RepresentationsOfObject, R 120
- Representative, R 266
- representative, of a list or collection, R 266
- RepresentativeAction, R 392
- RepresentativeLinearOperation, R 617
- RepresentativeOperation, R 832
- RepresentativesContainedRightCosets, R 348
- RepresentativesFusions, R 792
- RepresentativeSmallest, R 266
- RepresentativesMinimalBlocks, R 398
- RepresentativesPerfectSubgroups, R 366
- RepresentativesPowerMaps, R 787
- RepresentativesSimpleSubgroups, R 366
- RepresentativeTom, R 705
- RepresentativeTomByGenerators, R 705
- RepresentativeTomByGeneratorsNC, R 705
- Requesting one GAP Package from within Another, E 37
- RequirePackage, R 832
- Reread, R 95
- REREADING, R 95
- RereadPackage, R 829
- RereadPkg, R 832
- ResetFilterObj, P 18
- ResetOptionsStack, R 87
- residue, quadratic, R 137
- Residue Class Rings, R 132
- RespectsAddition, R 303
- RespectsAdditiveInverses, R 303
- RespectsInverses, R 303
- RespectsMultiplication, R 302
- RespectsOne, R 303
- RespectsScalarMultiplication, R 304
- RespectsZero, R 304
- RestoreStateRandom, R 269
- Restricted and Induced Class Functions, R 763
- RestrictedClassFunction, R 763
- RestrictedClassFunctions, R 764
- Restricted Lie algebras, R 635
- RestrictedMapping, R 298
- RestrictedPartitions, R 150
- RestrictedPerm, R 405
- RestrictedTransformation, R 544
- Resultant, R 661
- ResultOfStraightLineProgram, R 332
- Return, R 57
- return, R 66
  - no value, R 57
  - with value, R 57
- ReturnFail, R 61
- ReturnFalse, R 61
- return from break loop, R 66
- ReturnTrue, R 61
- Reversed, R 194
- RewindStream, R 99
- RewriteWord, R 461
- Rewriting in Groups and Monoids, R 338
- Rewriting Systems and the Knuth-Bendix Procedure, R 540
- RightActingAlgebra, R 620
- RightActingRingOfIdeal, R 554
- RightAlgebraModule, R 618
- RightAlgebraModuleByGenerators, R 618
- RightCoset, R 346
- RightCosets, R 347
- right cosets, R 346
- RightCosetsNC, R 347
- RightDerivations, R 627
- RightIdeal, R 552
- RightIdealByGenerators, R 553
- RightIdealNC, R 553
- RightModuleByHomomorphismToMatAlg, R 621
- RightShiftRowVector, R 212
- RightTransversal, R 347
- right transversal, T 48
- Ring, R 550
- RingByGenerators, R 551
- Ring Homomorphisms, R 305

- Rings With One, *R 554*
- RingWithOne, *R 554*
- RingWithOneByGenerators, *R 554*
- RNameObj, *R 259*
- root, of 1 modulo an integer, *R 138*
  - of an integer, *R 127*
  - of an integer, smallest, *R 127*
  - of an integer modulo another, *R 137*
- RootInt, *R 127*
- RootMod, *R 137*
- RootOfDefiningPolynomial, *R 568*
- RootsMod, *R 137*
- Roots Modulo Integers, *R 136*
- roots of unity, *R 153*
- RootsOfUPol, *R 660*
- RootsUnityMod, *R 138*
- RootSystem, *R 632*
- RoundCyc, *R 155*
- Row and Matrix Spaces, *R 592*
- RowIndexOfReesMatrixSemigroupElement, *R 533*
- RowIndexOfReesZeroMatrixSemigroupElement, *R 533*
- row spaces, *R 592*
- Row Vectors over Finite Fields, *R 210*
- Rules, *R 336*
- Running GAP under MacOS, *R 30*
- Runtime, *R 80*
- Runtimes, *R 79*
- S**
- $s_N$ , *R 158*
- SameBlock, *R 726*
- SandwichMatrixOfReesMatrixSemigroup, *R 533*
- SandwichMatrixOfReesZeroMatrixSemigroup, *R 533*
- save, *R 36*
- SaveOnExitFile, *R 72*
- SaveWorkspace, *R 36*
- Saving and Loading a Workspace, *R 36*
- Saving a Pc Group, *R 448*
- saving on exit, *R 71*
- ScalarProduct, for characters, *R 760*
- Schreier, *R 473*
- Schreier-Sims, random, *R 410*
- SchreierTransversal, *N 16*
- SchreierTreeDepth, *N 17*
- SchurCover, *R 372*
- Schur Covers and Multipliers, *R 372*
- Schur multiplier, *R 373*
- scope, *R 41*
- ScriptFromString, *R 701*
- Searching for Homomorphisms, *R 383*
- SecHMSM, *R 252*
- secondary subgroup generators, *R 489*
- SecondsDMYhms, *R 252*
- SeekPositionStream, *R 100*
- Selecting a Different MeatAxe, *R 682*
- Selection Functions, *R 506*
- SemidirectProduct, *R 495*
- Semidirect Products, *R 494*
- SemiEchelonBasis, *R 594*
- SemiEchelonBasisNC, *R 594*
- SemiEchelonMat, *R 224*
- SemiEchelonMatDestructive, *R 224*
- SemiEchelonMats, *R 225*
- SemiEchelonMatsDestructive, *R 225*
- SemiEchelonMatTransformation, *R 225*
- Semigroup, *R 527*
- semigroup, *R 527*
- SemigroupByGenerators, *R 527*
- SemigroupByMultiplicationTable, *R 528*
- SemigroupIdealByGenerators, *R 529*
- SemigroupOfRewritingSystem, *R 542*
- semiregular, *R 397*
- Semisimple Lie Algebras and Root Systems, *R 631*
- SemiSimpleType, *R 631*
- sequence, Bernoulli, *R 144*
  - Fibonacci, *R 151*
  - Lucas, *R 152*
- Series of Ideals, *R 629*
- Set, *R 263*
- SetAssertionLevel, *R 79*
- SetCommutator, *R 446*
- SetConjugate, *R 446*
- SetCrystGroupDefaultAction, *R 425*
- set difference, of collections, *R 268*
- SetElmWPObj, *E 52*
- SetEntrySCTable, *R 602*
- SetFilterObj, *P 18*
- SetGasmanMessageStatus, *R 85*
- SetHashEntry, *N 12*
- SetHashEntryAtLastIndex, *N 12*
- SetHelpViewer, *R 24*
- SetIndeterminateName, *R 655*
- SetInfoLevel, *R 78*
- SetName, *R 114*

- Set Operations via Boolean Lists, *R 205*
- SetParent, *R 283*
- SetPower, *R 446*
- SetPrintFormattingStatus, *R 101*
- SetRecursionTrapInterval, *R 84*
- SetReducedMultiplication, *R 455*
- Sets, *R 109, T 31*
- sets, *R 168*
- Sets of Subgroups, *R 363*
- set stabilizer, *R 391*
- Setter, *R 121*
- setter, *R 120*
  - of an attribute, *T 72*
- Setter and Tester for Attributes, *R 120*
- SetX, *R 200*
- ShallowCopy, *R 113, T 80*
  - for lists, *R 175*
- ShiftedCoeffs, *R 214*
- ShiftedPadicNumber, *R 679*
- Shifting and Trimming Coefficient Lists, *R 212*
- ShortestVectors, *R 240*
- ShortLexOrdering, *R 276*
- short vectors spanning a lattice, *R 766*
- ShowArgument, *R 75*
- ShowArguments, *R 75*
- ShowDetails, *R 75*
- ShowImpliedFilters, *R 117*
- ShowMethods, *R 75*
- ShowOtherMethods, *R 76*
- ShrinkCoeffs, *R 214*
- ShrinkRowVector, *R 212*
- Sift, for chains of subgroups, *N 19*
- SiftedPcElement, *R 429*
- SiftedPermutation, *R 415*
- SiftedVector, *R 595*
- SiftOneLevel, for chains of subgroups, *N 19*
  - for subgroup transversals, *N 16*
- Sigma, *R 138*
- sign, of an integer, *R 126*
- Sign and Cycle Structure, *R 404*
- SignInt, *R 126*
- SignPartition, *R 150*
- SignPerm, *R 404*
- SimpleLieAlgebra, *R 627*
- SimpleSystem, *R 632*
- SimplifiedFpGroup, *R 473*
- SimplifiedFpGroup, *R 473*
- SimplifyPresentation, *R 480*
- SimsNo, *R 517*
- SimultaneousEigenvalues, *R 230*
- SingleCollector, *R 446*
- singlequote character, *R 244*
- singlequotes, *R 242*
- SINT\_CHAR, *R 250*
- Size, *R 266*
  - for character tables, *R 720*
  - for groups with pcgs, *R 441*
- size, of a list or collection, *R 266*
- SizeBlist, *R 205*
- SizeConsiderFunction, *R 369*
- SizeNumbersPerfectGroups, *R 512*
- SizeOfChainOfGroup, *N 19*
- SizeOfFieldOfDefinition, *R 782*
- SizesCentralizers, *R 721*
- SizesConjugacyClasses, *R 721*
- SizeScreen, *R 74*
- SizeScreen, *R 74*
- SizesPerfectGroups, *R 511*
- SizeStabChain, *R 414*
- SL, *R 502*
- smaller, associative words, *R 326*
  - elements of finitely presented groups, *R 455*
  - nonassociative words, *R 319*
  - pcwords, *R 444*
  - rational functions, *R 656*
- SmallerDegreePermutationRepresentation, *R 407*
- smaller or equal, *R 46*
- smaller test, *R 46*
- SmallestGeneratorPerm, *R 403*
- SmallestMovedPoint, *R 403*
- SmallestRootInt, *R 127*
- SmallGeneratingSet, *R 370*
- SmallGroup, *R 509*
- Small Groups, *R 508*
- SmallGroupsInformation, *R 509*
- Smash MeatAxe Flags, *R 686*
- smith normal form, *R 832*
- SmithNormalFormIntegerMat, *R 235*
- SmithNormalFormIntegerMatTransforms, *R 235*
- SMTX.AbsoluteIrreducibilityTest, *R 686*
- SMTX.AlgEl, *R 686*
- SMTX.AlgElCharPol, *R 687*
- SMTX.AlgElCharPolFac, *R 687*
- SMTX.AlgElMat, *R 686*
- SMTX.AlgElNullspaceDimension, *R 687*

- SMTX.AlgElNullspaceVec, R 687
- SMTX.CentMat, R 687
- SMTX.CentMatMinPoly, R 687
- SMTX.CompleteBasis, R 686
- SMTX.Getter, R 686
- SMTX.GoodElementGModule, R 686
- SMTX.IrreducibilityTest, R 686
- SMTX.MatrixSum, R 686
- SMTX.MinimalSubGModule, R 686
- SMTX.MinimalSubGModules, R 686
- SMTX.RandomIrreducibleSubGModule, R 686
- SMTX.Setter, R 686
- SMTX.SortHomGModule, R 686
- SMTX.Subbasis, R 686
- SO, R 503
- Socle, R 354
- SocleTypePrimitiveGroup, R 408
- SolutionIntMat, R 233
- SolutionMat, R 223
- SolutionMatDestructive, R 223
- SolutionNullspaceIntMat, R 233
- Some Remarks about Character Theory in GAP,  
R 709
- Some Special Algebras, R 604
- Something, T 69
- Sort, R 189
- SortedCharacters, R 743
- SortedCharacterTable, R 744
- Sorted Character Tables, R 743
- SortedList, R 263
- sorted list, R 188
- Sorted Lists and Sets, R 190
- sorted lists as collections, R 261
- SortedSparseActionHomomorphism, R 394
- SortedTom, R 692
- Sortex, R 190
- Sorting Lists, R 189
- SortingPerm, R 190
- Sorting Tables of Marks, R 692
- SortParallel, R 189
- Source, N 14, R 299
- SourceElt, N 14
- SP, R 503
- Sp, R 503
- space, R 39
- SparseActionHomomorphism, R 394
- SparseCartanMatrix, R 633
- SparseHashTable, N 11
- Sparse hash tables, N 11
- SparseIntKey, N 11
- Special Characters, R 244
- special character sequences, R 244
- Special Filenames, R 91
- Special Generating Sets, R 369
- SpecialLinearGroup, R 502
- Special Multiplication Algorithms for Matrices over  
GF(2), R 231
- SpecialOrthogonalGroup, R 503
- Special Pcgs, R 437
- SpecialPcgs, attribute, R 438
- SpecialUnitaryGroup, R 502
- Specific and Parametrized Subgroups, R 352
- Specific Methods for Subgroup Lattice  
Computations, R 367
- SplitCharacters, R 738
- SplitExtension, R 449
- SplitExtensions, R 450
- SplitString, R 247
- SplittingField, R 659
- Sqrt, R 289
- square root, of an integer, R 127
- SquareRoots, R 316
- SSortedList, R 263
- StabChain, R 411
- StabChainBaseStrongGenerators, R 413
- StabChainImmutable, R 411
- StabChainMutable, R 411
- StabChainOp, R 411
- StabChainOptions, R 413
- Stabiliser chain subgroups, N 20
- Stabilizer, R 391
- Stabilizer Chain Records, R 413
- Stabilizer Chains, R 409
- Stabilizer Chains for Automorphisms Acting on  
Enumerators, E 61
- StabilizerOfExternalSet, R 400
- StabilizerPcgs, R 441
- Stabilizers, R 391
- Standalone Programs in a GAP Package, E 38
- StandardAssociate, R 557
- StandardGeneratorsFunctions, R 702
- StandardGeneratorsInfo, for groups, R 700  
for tables of marks, R 705
- StandardGeneratorsOfGroup, R 702
- Standard Generators of Groups, R 700
- Standardization of coset tables, R 460

- StandardizeTable, R 460
- StarCyc, R 160
- Starting and Leaving GAP, *T 18*
- starting GAP, *T 18*
- Statements, *R 48*
- StateRandom, R 269
- Stirling1, R 144
- Stirling2, R 144
- Stirling number of the first kind, R 144
- Stirling number of the second kind, R 145
- StoredGroebnerBasis, R 671
- StoreFusion, R 790
- Storing Normal Subgroup Information, *R 747*
- StraightLineProgElm, R 335
- StraightLineProgGens, R 335
- StraightLineProgram, R 331
- Straight Line Program Elements, *R 334*
- StraightLineProgramNC, R 331
- Straight Line Programs, *R 331*
- StraightLineProgramsTom, R 704
- StratMeetPartition, E 59
- StreamsFamily, R 97
- StretchImportantSLPElement, R 335
- strictly sorted list, R 189
- String, R 247
  - for cyclotomics, R 154
- StringDate, R 252
- StringOfResultOfStraightLineProgram, R 333
- StringPP, R 247
- strings, *T 28*
  - equality of, R 246
  - inequality of, R 246
  - lexicographic ordering of, R 246
- String Streams, *R 103*
- StringTime, R 252
- StrongGeneratorsStabChain, R 414
- StrongGens, N 20
- StronglyConnectedComponents, R 309
- Struct, R 280
- StructByGenerators, R 281
- StructuralCopy, R 113, *T 80*
  - for lists, R 176
- structure constant, R 730
- StructureConstantsTable, R 590
- StructWithGenerators, R 281
- SU, R 502
- Subalgebra, R 605
- SubAlgebraModule, R 621
- SubalgebraNC, R 605
- Subalgebras, *R 605*
- SubalgebraWithOne, R 605
- SubalgebraWithOneNC, R 606
- SubdirectProduct, R 496
- Subdirect Products, *R 496*
- SubdirectProducts, R 497
- Subdomains, *T 70*
- subdomains, R 284
- Subfield, R 567
- SubfieldNC, R 567
- Subfields, R 568
- Subfields of Fields, *R 567*
- Subgroup, R 343
- SubgroupByPcgs, R 432
- SubgroupByProperty, R 344
- subgroup fusions, R 788
- subgroup generators tree, R 489
- Subgroup Lattice, *R 365*
- SubgroupNC, R 343
- SubgroupOfWholeGroupByCosetTable, R 461
- SubgroupOfWholeGroupByQuotientSubgroup, R 466
- Subgroup Presentations, *R 473*
- SubgroupProperty, R 417
- Subgroups, Subgroups, as Stabilizers, *T 50*
- Subgroups, *R 342*
- subgroups, polyhedral, R 730
- Subgroups characterized by prime powers, *R 355*
- Subgroup Series, *R 359*
- SubgroupShell, R 344
- Subgroups of Polycyclic Groups - Canonical Pcgs, *R 432*
- Subgroups of Polycyclic Groups - Induced Pcgs, *R 430*
- SubgroupsSolvableGroup, R 368
- sublist, R 170
  - access, R 170
  - assignment, R 172
  - operation, R 171
- sublist assignment, operation, R 173
- Submagma, R 313
- SubmagmaNC, R 313
- SubmagmaWithInverses, R 313
- SubmagmaWithInversesNC, R 313
- SubmagmaWithOne, R 313
- SubmagmaWithOneNC, R 313
- Submodule, R 563

- SubmoduleNC, R 563
  - Submodules, *R 563*
  - Submonoid, R 534
  - SubmonoidNC, R 534
  - SubnearAdditiveGroup, R 548
  - SubnearAdditiveGroupNC, R 548
  - SubnearAdditiveMagma, R 547
  - SubnearAdditiveMagmaNC, R 547
  - SubnearAdditiveMagmaWithZero, R 547
  - SubnearAdditiveMagmaWithZeroNC, R 547
  - SubnormalSeries, R 360
  - Subring, R 551
  - SubringNC, R 551
  - SubringWithOne, R 555
  - SubringWithOneNC, R 555
  - Subroutines for the Construction of Class Fusions,  
*R 803*
  - Subroutines for the Construction of Power Maps,  
*R 801*
  - subsection mark-up, E 16
  - Subsemigroup, R 527
  - SubsemigroupNC, R 527
  - subsets, R 145
  - subset test, for collections, R 267
  - Subsomething, T 70
  - SubsomethingNC, T 70
  - Subspace, R 584
  - SubspaceNC, R 584
  - Subspaces, R 585
  - SubstitutedWord, R 328
  - SubsTom, R 693
  - Substruct, R 284
  - SubstructNC, R 284
  - SubSyllables, R 329
  - subtract, a set from another, R 192
  - SubtractBlist, R 206
  - subtraction, R 47
    - matrices, R 216
    - matrix and scalar, R 216
    - rational functions, R 656
    - scalar and matrix, R 216
    - scalar and matrix list, R 217
    - scalar and vector, R 209
    - vector and scalar, R 209
    - vectors, R 209
  - SubtractSet, R 192
  - Subword, R 327
  - Successors, R 308
  - Suitability for Compilation, *R 35*
  - Sum, R 199
  - Sum and Intersection of Pcgs, *R 437*
  - SumFactorizationFunctionPcgs, R 437
  - SumIntersectionMat, R 226
  - SumX, R 200
  - SupersolvableResiduum, R 354
  - support, email address, R 820, T 16
  - SupportedCharacterTableInfo, R 713
  - Suppressing Indexing and Labelling of a Section and  
Resolving Label Clashes, *E 15*
  - SurjectiveActionHomomorphismAttr, R 401
  - SuzukiGroup, R 501
  - SylowComplement, R 354
  - SylowSubgroup, R 354
  - Sylow Subgroups and Hall Subgroups, *R 354*
  - SylowSystem, R 355
  - Symbols, *R 39*
  - Symmetric and Alternating Groups, *R 407*
  - SymmetricClosureBinaryRelation, R 309
  - SymmetricGroup, R 501
  - symmetric group, powermap, R 151
  - SymmetricParentGroup, R 408
  - SymmetricParts, R 772
  - SymmetricPowerOfAlgebraModule, R 646
  - symmetric relation, R 307
  - Symmetrizations, R 771
  - symmetrizations, orthogonal, R 772
    - symplectic, R 773
  - Symmetrizations of Class Functions, *R 771*
  - SymplecticComponents, R 773
  - SymplecticGroup, R 503
  - syntax errors, R 63
  - system getter, R 120
  - system setter, R 120
  - Sz, R 501
- T**
- $t_N$ , R 158
  - TableAutomorphisms, R 746
  - table automorphisms, R 804
  - TableHasIntKeyFun, N 11
  - table of chapters for help books, R 23
  - TableOfMarks, R 689
  - TableOfMarksByLattice, R 690
  - TableOfMarksComponents, R 693
  - TableOfMarksCyclic, R 707
  - TableOfMarksDihedral, R 707

- TableOfMarksFamily, R 693
- TableOfMarksFrobenius, R 707
- Table of Marks Objects in GAP, R 688
- table of sections for help books, R 23
- tables, E 23, R 711
- Tables, Displayed Mathematics and Mathematics Alignments, E 23
- tabulator, R 39
- Tau, R 138
- Technical Details about Tables of Marks, R 693
- Technical Details about the Implementation of Magma Rings, R 652
- Technical Matters Concerning General Mappings, R 305
- TemporaryGlobalVarName, R 44
- Tensored, R 763
- TensorProductGModule, R 682
- TensorProductOfAlgebraModules, R 645
- Tensor Products and Exterior and Symmetric Powers, R 645
- test, for a primitive root, R 136
  - for a rational, R 141
  - for records, R 254
  - for set equality, R 191
- TestConsistencyMaps, R 797
- Tester, R 121
- tester, R 120
  - of an attribute, T 72
- Test Files, R 83
- Test for the Existence of GAP Package Binaries, E 38
- TestHomogeneous, R 807
- TestInducedFromNormalSubgroup, R 809
- Testing Finiteness of Finitely Presented Groups, R 469
- Testing for the System Architecture, R 34
- Testing Monomiality, R 809
- Testing the Examples, E 24
- TestJacobi, R 602
- TestMonomial, R 809
- TestMonomialQuick, R 810
- TestMonomialUseLattice, R 810
- Test of the installation, R 816
- TestPackageAvailability, R 829
- TestPerm1, R 779
- TestPerm2, R 779
- TestPerm3, R 779
- TestPerm4, R 779
- TestPerm5, R 779
- TestQuasiPrimitive, R 808
- TestRelativelySM, R 811
- Tests for Actions, R 396
- Tests for the Availability of Methods, R 373
- TestSubnormallyMonomial, R 811
- TeX Macros, E 16
- TeX Macros for Domains, E 20
- The .gaprc file, R 33
- The Adjoint Representation, R 636
- The Compiler, R 34
- The Defining Attributes of Rational Functions, R 673
- The Dixon-Schneider Algorithm, R 736
- The Documentation, R 818
- The External Representation for Associative Words, R 330
- The family pcgs, R 443
- The Files of a GAP Package, E 35
- The GAP System, T 10
- The GASMAN Interface for Weak Pointer Objects, E 53
- The General Backtrack Algorithm with Ordered Partitions, E 55
- The Help Book Handler, E 43
- The Info Mechanism, T 85
- The Interface between Character Tables and Groups, R 715
- The Interface between Tables of Marks and Character Tables, R 706
- The Library of Tables of Marks, R 708
- The Main File, E 11
- The manual.six File, E 42
- then, R 50
- The Natural Action, R 406
- The PackageInfo.g File, E 37
- The Pager Command, R 25
- The Permutation Image of an Action, R 393
- The Representations of Rational Functions, R 672
- The Smash MeatAxe, R 685
- The Syntax in BNF, R 57
- The WWW Homepage of a Package, E 36
- ThreeGroup library, R 508
- Tietze Options, R 492
- Tietze Transformations, R 479
- Tietze Transformations that introduce new Generators, R 483
- TietzeWordAbstractWord, R 477

- time, R 80
- Timing, *R 79*
- Todd-Coxeter Procedure, *R 542*
- Trace, R 218
  - for field elements, R 569
  - of a matrix, R 218
- TracedCosetFpGroup, R 457
- TraceImmediateMethods, R 77
- TraceMat, R 218
- TraceMethods, R 77, T 75
- TracePolynomial, R 569
- Tracing generator images through Tietze transformations, *R 487*
- Tracing Methods, *R 77*
- TransferDiagram, R 797
- Transformation, R 543
- TransformationData, R 543
- TransformationFamily, R 543
- TransformationNC, R 543
- TransformationRelation, R 545
- TransformationType, R 543
- TransformingPermutations, R 746
- TransformingPermutationsCharacterTables, R 746
- transitive, R 396
- TransitiveClosureBinaryRelation, R 309
- TransitiveGroup, R 507
- TransitiveIdentification, R 507
- Transitive Permutation Groups, *R 507*
- transitive relation, R 307
- Transitivity, for characters, R 762
  - for class functions, R 762
  - for group actions, R 397
- TranslatorSubalgebra, R 623
- transporter, R 392
- TransposedMat, R 220
- TransposedMatAttr, R 220
- TransposedMatDestructive, R 220
- TransposedMatImmutable, R 220
- TransposedMatMutable, R 220
- TransposedMatOp, R 220
- TransposedMatrixGroup, R 420
- Transversal, N 19
- TransversalBySiftFunction, N 18
- TransversalByTrivial, N 18
- TransversalElt, N 16
- TransversalOfChainSubgroup, N 20
- Transversals, *R 347*
- Transversals by direct products, *N 18*
- Transversals by homomorphic images, *N 17*
- Transversals by Schreier tree, *N 16*
- Transversals by sift functions, *N 18*
- Transversals by Trivial subgroups, *N 18*
- Triangular Matrices, *R 226*
- TriangulizedIntegerMat, R 234
- TriangulizedIntegerMatTransform, R 234
- TriangulizedNullspaceMat, R 222
- TriangulizedNullspaceMatDestructive, R 222
- TriangulizeIntegerMat, R 234
- TriangulizeMat, R 222
- Trivial chain subgroups and sift function chain subgroups, *N 21*
- TrivialCharacter, R 758
- TrivialGroup, R 499
- TrivialIterator, R 272
- TrivialSubalgebra, R 606
- TrivialSubgroup, R 352
- TrivialSubmagmaWithOne, R 316
- TrivialSubmodule, R 563
- TrivialSubmonoid, R 534
- TrivialSubnearAdditiveMagmaWithZero, R 548
- TrivialSubspace, R 585
- TryConwayPolynomialForFrobeniusCharacterValue, R 782
- TryCosetTableInWholeGroup, R 461
- TryGcdCancelExtRepPolynomials, R 675
- TryNextMethod, P 12, T 74
- Tuples, R 147
- tuple stabilizer, R 391
- TwoClosure, R 417
- TwoCoboundaries, R 448
- TwoCocycles, R 448
- TwoCohomology, R 449
- TwoGroup library, R 508
- TwoSidedIdeal, R 552
- TwoSidedIdealByGenerators, R 553
- TwoSidedIdealNC, R 553
- TwoSquares, R 139
- type, boolean, R 165
  - cyclotomic, R 153
  - records, R 254
  - strings, R 242
- TypeObj, R 124
- TypeOfDefaultGeneralMapping, R 306
- Types, *R 124*
- TzEliminate, R 482

- TzFindCyclicJoins, R 483
- TzGo, R 479
- TzGoGo, R 481
- TzImagesOldGens, R 487
- TzInitGeneratorImages, R 487
- TzNewGenerator, R 479
- TzOptions, R 492
- TzPreImagesNewGens, R 488
- TzPrint, R 478
- TzPrintGeneratorImages, R 488
- TzPrintGenerators, R 477
- TzPrintLengths, R 478
- TzPrintOptions, R 493
- TzPrintPairs, R 478
- TzPrintPresentation, R 478
- TzPrintRelators, R 477
- TzPrintStatus, R 478
- TzSearch, R 482
- TzSearchEqual, R 483
- TzSort, R 471
- TzSubstitute, R 484
- TzSubstituteCyclicJoins, R 487
- U**
- $u_N$ , R 158
- UglyVector, R 597
- Umlauts, *E 26*
- Unbind, R 42
  - for lists, R 174
- UnbindElmWPObj, *E 52*
- UnbindGlobal, R 44
- UnderlyingCharacteristic, R 722
- UnderlyingCharacterTable, R 752
- UnderlyingElement, fp group elements, R 456
  - fp semigroup elements, R 539
- UnderlyingElementOfReesMatrixSemigroup-Element, R 533
- UnderlyingElementOfReesZeroMatrixSemigroup-Element, R 533
- UnderlyingExternalSet, R 401
- UnderlyingFamily, R 626
- UnderlyingGeneralMapping, R 299
- UnderlyingGroup, for character tables, R 715
  - for tables of marks, R 695
- UnderlyingLeftModule, R 588
- UnderlyingLieAlgebra, R 632
- UnderlyingMagma, R 649
- UnderlyingRelation, R 299
- Undocumented Variables, *E 33*
- UnInstallCharReadHookFunc, R 105
- Union, R 268
  - union, of collections, R 268
    - of sets, R 192
- Union2, R 268
- UnionBlist, R 205
- Unique, R 193
- UniteBlist, R 206
- UniteBlistList, R 206
- UniteSet, R 192
- Units, R 556
- Units and Factorizations, *R 556*
- UnivariatenessTestRationalFunction, R 660
- UnivariatePolynomial, R 659
- UnivariatePolynomialByCoefficients, R 659
- UnivariatePolynomialRing, R 667
- Univariate Polynomial Rings, *R 667*
- Univariate Polynomials, *R 659*
- UnivariateRationalFunctionByCoefficients, R 665
- Univariate Rational Functions, *R 665*
- UniversalEnvelopingAlgebra, R 638
- Universal Enveloping Algebras, *R 638*
- UNIX, features, R 27
  - options, R 27
- UNIXSelect, R 97
- Unknown, R 163
- UnloadSmallGroupsData, R 509
- UnorderedTuples, R 146
- Unpacking, *R 814*
- UnprofileFunctions, R 81
- UnprofileMethods, R 81
- until, R 51
- UntraceMethods, R 77
- UpdateMap, R 795
- UpEnv, R 69
- UpperCentralSeriesOfGroup, R 361
- UpperSubdiagonal, R 227
- Usage of the Percent Symbol, *E 24*
- UseBasis, R 564
- UseFactorRelation, R 290
- Useful Categories for all Elements of a Family, *R 293*
- Useful Categories of Elements, *R 291*
- UseIsomorphismRelation, R 290
- User Streams, *R 102*
- UseSubsetRelation, R 290
- Using buildman.pe, *E 27*

utilities for editing GAP files, R 73

## V

V, (global) Variable mark-up, E 16  
 $v_N$ , R 158  
 Valuation, R 679  
 Value, R 661  
 ValueCochain, R 641  
 ValueGlobal, R 43  
 ValueMolienSeries, R 775  
 ValueOption, R 87  
 ValuePol, R 213  
 ValuesOfClassFunction, R 752  
 Variable Access in a Break Loop, R 69  
 Variables, R 41  
 variables, T 22  
 vectors, row, T 36  
 Vectors and Matrices, T 36  
 Vectors as coefficients of polynomials, R 213  
 VectorSpace, R 584  
 VectorSpaceByPcgsOfElementaryAbelianGroup,  
 R 439  
 Vector Space Homomorphisms, R 595  
 Vector Spaces, T 59  
 Vector Spaces Handled By Nice Bases, R 597  
 verbatim environments, E 22  
 Version Numbers, E 40  
 vi, R 73  
 View, R 64  
 View and Print, R 64  
 ViewObj, R 65  
   for character tables, R 731  
   for class functions, R 756  
   for tables of marks, R 690  
 vim, R 73  
 VirtualCharacter, R 757  
 virtual character, R 759  
 virtual characters, R 750

## W

$w_N$ , R 158  
 WeakPointerObj, E 51  
 WeakPointerObj, E 51  
 Weak Pointer Objects, E 51  
 web sites, for GAP, T 16  
 WedgeGModule, R 682  
 WeekDay, R 252  
 WeightLexOrdering, R 276  
 WeightOfGenerators, R 277  
 WeightsTom, R 696  
 WeightVecFFE, R 212  
 WeylGroup, R 633  
 WeylOrbitIterator, R 635

Where, R 69, T 85  
 While, R 50  
 while loop, R 50  
 whitespace, T 19  
 Whitespaces, R 39  
 Why Class Functions?, R 750  
 Why Proceed in a Different Way?, P 45  
 WordAlp, R 247  
 words, in generators, R 345  
 Working with large degree permutation groups,  
 R 417  
 Wrapping Up a GAP Package, E 40  
 WreathProduct, R 497  
 wreath product embedding, R 498  
 WreathProductImprimitiveAction, R 497  
 WreathProductOrdering, R 278  
 WreathProductProductAction, R 498  
 Wreath Products, R 497  
 WriteAll, R 100  
 WriteByte, R 100  
 WriteLine, R 100  
 Writing Documentation, E 35  
 Writing Functions, T 40

## X

X, T 78  
 $x_N$ , R 158

## Y

$y_N$ , R 158

## Z

Z, R 572  
 ZClassRepsQClass, R 424  
 Zero, R 286  
 ZeroAttr, R 286  
 ZeroCoefficient, R 650  
 ZeroCoefficientRatFun, R 674  
 ZeroImmutable, R 286  
 ZeroMapping, R 297  
 ZeroMutable, R 286  
 ZeroOp, R 286  
 ZeroSameMutability, R 286  
 ZeroSM, R 286  
 ZippedProduct, R 675  
 ZippedSum, R 675  
 ZmodnZ, R 132  
 ZmodnZObj, R 133  
 ZmodpZ, R 132  
 ZmodpZNC, R 132  
 zoo, E 40  
 ZumbroichBase, R 580  
 Zuppos, R 367