

Index

- ad-diagonalizable, 18
- algorithm
 - direct sum decomposition, 56
 - Levi decomposition, 63
 - nilradical, 75
- associative algebra
 - semisimple, 48
- automorphism, 15

- Borel nilradical, 142
- Borel subalgebra, 142

- Cartan matrix, 19
- Cartan subalgebra, 17
- Casimir invariant, 23
 - generalized, 23, 24, 41, 218
- Casimir operator, 23
- center, 12
 - higher, 12
- central automorphism, 51
- central decomposition, 51
- centralizer, 13
- characteristic sequence, 46
- characteristically nilpotent, 100
- coboundary, 21, 94, 101
- cochain, 20
- cochain complex, 21
- cocycle, 21, 94, 101
 - twisted, 45
- cohomology, 21, 95, 101, 108
- cohomology operator, 21
- commuting algebra, 47
- composition series, 71

- decomposable matrix, 47
- degree of nilpotency, 12
- derivation, 15, 42
 - (α, β, γ) -, 42
 - inner, 15
 - outer, 15
- derived algebra, 11
- division ring, 48
- Dixmier invariant, 41
- Dynkin diagram, 19, 40

- epimorphism, 71

- filiform algebra, 175
 - adapted basis, 175
 - model, 175
 - \mathbb{N} -graded, 190
 - special, 176

- Galilei algebra, 131
 - extended, 131

- Heisenberg algebra, 131
- highest root, 143
- hypercenter, 12, 73

- ideal, 11
 - characteristic, 15
- idempotent, 47
 - orthogonal, 47
 - trivial, 47
- invariant form, 16
- invariant subspace, 14

- Killing form, 16, 41, 97
- Kravchuk normal form, 93
- Kravchuk signature, 93

- Levi decomposition, 3, 63, 203, 241, 296
 - nontrivial, 203
- Levi extension, 204
- Levi factor, 6, 17, 63
- Lie algebra, 11
 - absolutely indecomposable, 53, 56
 - decomposable, 47, 50, 56
 - indecomposable, 54
 - nilpotent, 12, 89, 225, 227, 231, 243
 - perfect, 11, 63
 - rank, 18, 40
 - semisimple, 13
 - simple, 11, 17, 226, 296
 - solvable, 11, 99, 225–227, 232, 248
 - symplectic, 131
- linearly nilindependent elements, 99
- linearly nilindependent matrices, 99

- MAPLE

- computer algebra system, 219
 - LieAlgebras package, 219
- method of characteristics, 24
- method of moving frames, 32
- minimal polynomial, 54

- nilpotent element, 99
- nilradical, 13, 71, 99
 - Abelian, 102, 107
 - Borel, 141
 - filiform, 175
 - Heisenberg, 131
- normalizer, 13

- point transformation, 4

- radical, 3, 12, 17, 63, 64, 75
 - Jacobson, 48
- rank
 - of nilpotent algebra, 46
- representation, 14
 - adjoint, 14
 - faithful, 14
 - fully reducible, 14
 - irreducible, 14
 - reducible, 14
- root, 18
 - positive, 18
 - simple, 18
- root subspace, 18
- root system, 18

- semisimple element, 18
- series
 - characteristic, 12, 40
 - derived (DS), 11, 218
 - lower central (CS), 12, 218
 - upper central (US), 12, 218
- solvable extension, 100
- split real form, 18, 142
- subalgebra, 11

- theorem
 - Cartan's criteria, 16, 39
 - Levi, 3, 17
 - Schur lemma, 14
- triangular nilradical, 154

- Weyl group, 19
- Weyl–Chevalley basis, 18