

# Index

- $\lambda$ -bracket, 93, 213
- $n$ -th product, 92
- $q$ -character, 196, 201
  
- affine Kac–Moody algebra, 93
- affine Poisson vertex algebra, 214
- affine symmetric polynomial, 102
- annihilation operator, 287
- anti-symmetrizer
  - in Brauer algebra, 14
  - in the symmetric group algebra, 5
  
- Bethe ansatz equations, 270
- Bethe vector, 270
- Bolsinov’s criterion, 163
- Bolsinov–Elashvili conjecture, 167
- box
  - addable, 1
  - removable, 1
- Brauer algebra, 7
- Brauer diagram, 6
- breaking pair, 198
  
- Capelli determinant, 64
- Casimir element, 55
- center
  - of universal enveloping algebra, 55
  - of vertex algebra, 92
- character of representation, 3
- characteristic map, 27
- Chevalley generators, 214
- Chevalley involution, 263
- Chevalley isomorphism, 23
- classical  $\mathcal{W}$ -algebra, 215
- closure map, 14
- column-determinant, 47
- column-minor, 160
- comatrix, 48
- complete set of Segal–Sugawara vectors, 96
- complete symmetric functions, 232
- completed universal enveloping algebra, 104
- content of a box, 1
- contents of updown tableau, 8
- Coxeter number, 153
  
- creation operator, 287
- critical level, 94, 182
- crossing symmetry, 180
- cyclic property of trace, 15, 19
  
- degenerate affine Hecke algebra, 56
- diagram, 1
- differential algebra, 213
- distance in multiset, 198
- dual Coxeter number, 93
  
- elementary symmetric functions, 232
- evaluation homomorphism, 170
- evaluation module, 170
- extremal projector, 39
  
- Feigin–Frenkel center, 94
- field, 91
- Fock representation, 287, 289, 292
- Fourier coefficient, 92
- free field realization, 277
- full trace, 15
- fusion procedure
  - for symmetric group, 6
  
- Gelfand invariant, 55, 66, 77
  
- Harish-Chandra
  - homomorphism, 55
  - isomorphism, 55
- harmonic polynomial, 194, 196, 198
- harmonic tensors, 194, 197
- highest vector, 57, 73
- highest weight, 193
- highest weight representation, 57, 73
- hook length formula, 2
- Howe duality, 39
  
- immanant, 26
  - quantum, 68
- index of a Lie algebra, 163
  
- Jacobi identity, 149
- Jucys–Murphy elements
  - for Brauer algebra, 7
  - for symmetric group, 3

- Kirillov–Reshetikhin module, 196
- Kostant’s slice, 154
- Laplace operator, 194, 196
- Leibniz rule, 149
- length of diagram, 1
- level of  $\widehat{\mathfrak{g}}$ -module, 93
- Lie algebra
  - general linear, 23
  - orthogonal, 28
  - special linear, 23
  - symplectic, 28
- Lie conformal algebra, 93
- Lie–Poisson bracket, 149
- lowest vector, 263, 265
- lowest weight representation, 263, 265
- MacMahon Master Theorem, 45
- Manin matrix, 43
  - of type  $C$ , 89
  - of types  $B$  and  $D$ , 89
- matrix presentation, 54
- Mishchenko–Fomenko subalgebra, 150
- Miura transformation, 228
- Nazarov–Wenzl algebra, 73
- Newton identity, 50, 66
- normal ordering, 94
- normalized Killing form, 93
- partial trace, 14
- partition, 1
- Pfaffian, 30, 82, 120, 145, 165
- plane partition, 103
- Poisson algebra, 149
- Poisson bracket, 149
- Poisson center, 149
- Poisson vertex algebra, 213
- primitive idempotents, 2
- regular element, 151
- reverse tableau, 179
- right-quantum matrix, 51
- Robinson hook dimension formula, 61
- row-determinant, 48
- Schur polynomial
  - double, 58
  - factorial, 58
- Schur–Weyl duality, 19, 60
- screening operator, 187, 189, 207, 211, 228
- Segal–Sugawara vector, 94
  - canonical, 95
- shift of argument subalgebra, 150
- skew diagram, 160
- skew Howe duality, 41
- skew Laplace operator, 198
- smooth module, 104
- state-field correspondence, 91
- subalgebra of vertex algebra, 92
- Sugawara operators, 105
- symmetric polynomial
  - factorial complete, 58
  - factorial elementary, 58
- symmetrizer
  - in Brauer algebra, 9
  - in the symmetric group algebra, 4
- tableau, 1
  - standard, 2
- trace, 18
- transfer matrix, 176
- translation operator, 91
- unitarity property, 180
- updown tableau, 8
- vacuum module, 93, 183
- vacuum vector, 91
- Verma module, 193
- vertex algebra, 91
  - affine, 94
  - commutative, 92
  - holomorphic, 92
- Vinberg’s quantization problem, 155
- Wakimoto module, 287, 290–292
- Weyl algebra, 287, 289, 292
- Weyl group, 23
- Yang  $R$ -matrix, 170
- Yang–Baxter equation, 14, 170
- Yangian, 169, 191
  - double, 180
  - dual, 177, 203
  - extended, 191
  - extended dual, 202
- Yangian character, 171
- Young basis, 2
- Young diagram, 1