

# Index

- $\alpha_0, \alpha_\ell, \alpha_{\mathbf{m}}, 69\text{--}71$   
 $\Delta, \Delta_+, \Delta_-, 70$   
 $\Delta^{re}, \Delta_+^{re}, \Delta_-^{re}, \Delta^{im}, \Delta_+^{im}, \Delta_-^{im}, 70$   
 $\bar{\Delta}_+, 72$   
 $\Delta(\mathbf{m}), \Delta(w), 74, 75$   
 $[\Delta(\mathbf{m})], 77, 147, 163, 170, 174$   
 $\partial, \partial_\ell, \partial_{max}, 51$   
 $\partial^\lambda, 4$   
 $(\gamma)_k, (\mu)_\nu, \text{xiii}, 4$   
 $[\lambda]_{(k)}, 8$   
 $|\{\lambda_{\mathbf{m}}\}|, 36, 72, 123$   
 $\Lambda_0, \Lambda_{j,\nu}, \Lambda^0, \Lambda_{j,\nu}^0, \Lambda(\lambda), 72$   
 $\Pi_0, 79$   
 $\Pi, \Pi', \Pi(\mathbf{m}), 69, 77$   
 $\varpi, 103$   
 $\vartheta, 4$   
 Ad, Adei, 2  
 AdV, AdV<sup>0</sup>, 22  
 $B, 70$   
 $B_r(c), 18$   
 $c(\lambda_{j,\nu} \rightsquigarrow \lambda_{j',\nu'}), 119$   
 $c_{\mathbf{m}}(\epsilon; \lambda), 114$   
 $\tilde{D}_4, \tilde{E}_6, \tilde{E}_7, \tilde{E}_8, 70, 140$   
 $D_4^{(m)}, E_6^{(m)}, E_7^{(m)}, E_8^{(m)}, 78, 96$   
 $d_\ell(\mathbf{m}), 50$   
 $d_{max}, \ell_{max}, 51$   
 $EO_n, 60, 156$   
 $f_{\mathbf{m}}, 65$   
 ${}_nF_{n-1}, \text{xiii}$   
 gcd, 35  
 $GL(n, R), 11$   
 $h(\alpha), 74$   
 $H_n, 59, 150$   
 $\mathfrak{h}_p, \mathfrak{h}_p^\vee, \tilde{\mathfrak{h}}_p, 72, 73$   
 $I, I', 69$   
 $I_c^\mu, \tilde{I}_c^\mu, 5$   
 idx, 36  
 $\text{idx}_{\mathbf{m}}, 104$   
 $I_p, 72$   
 $L, 2$   
 $L(\mathbf{m}; \lambda), 37$   
 $L(w), 74$   
 $mc_\mu, 5$   
 $\mathbf{m}(k), \lambda(k), \mu(k), \ell(k), 53$   
 $M(n, \mathbb{C}), M(m_1, m_2, \mathbb{C}), 11, 37$   
 $N_\nu(\mathbf{m}), 55, 57, 59, 66$   
 $\mathcal{O}, \tilde{\mathcal{O}}, \mathcal{O}_c, \mathcal{O}_c(\mu, m), 17$   
 ord, 2, 35  
 $P_{p+1,n}, P_n, 99, 147, 182$   
 $\mathcal{P}, \mathcal{P}_{p+1}, \mathcal{P}^{(n)}, \mathcal{P}_{p+1}^{(n)}, 35$   
 Pidx, 36  
 $P_{\mathbf{m}}, P_{\mathbf{m}}(\lambda), 63$   
 $P^\vee, P^*, 41$   
 $Q_+, 69$   
 $R, 2$   
 RAd, RAdL, 3  
 RAdV, 23  
 Ridx, 64  
 $R_{\mathbf{m}}(\epsilon, \lambda), 109$   
 $s, \mathbf{sm}, 36$   
 $s_\alpha, s_i, 69$   
 $S_\infty, S'_\infty, 36$   
 supp, 70  
 $T_\phi^*, 2$   
 Top, 57  
 $W_\infty, W'_\infty, \tilde{W}_\infty, 69$   
 $w_{\mathbf{m}}, 74$   
 $W[x; \xi], W(x; \xi), 1$   
 $X_6, 60$   
 $Z(A), Z(\mathbf{M}), 38, 49, 90, 92$   
 $\mathbb{Z}_{\geq 0}, \mathbb{Z}_{> 0}, 2$   
 accessory parameter, 40  
 addition, 5  
     confluence, 22  
     around the origin, 23  
 affine, 70  
 Airy equation, 8, 194  
 apparent singularity, 20, 21, 35  
 Bäcklund transformation, 143  
 characteristic exponent, 17  
     (compatible) shift, 109  
     distinct, 35  
     distinguished, 38  
     generalized, 31  
 confluence, 21  
     addition, 22  
 connection coefficient, 119  
     generalized, 133, 159, 166  
 contiguity relation, 29, 109, 111, 112  
 convolution, 49  
 coordinate transformation, 2  
     linear fractional, 51  
 Coxeter system, 197

- Deligne-Simpson problem, x, 55
- differential equation/operator
  - complete model, 194
  - cyclic vector, 11
  - degree, 2
  - dual, 41
  - Euclidean algorithm, 9
  - greatest common divisor, 9
  - irreducible, 12, 20
  - least common multiple, 9
  - mutually prime, 9
  - order, 2
  - reduced representative, 2
- direct decomposition, 96
  - example, 100
- dual partition, 33
- Dynkin diagram, 70, 142
- Euler transformation, 5
- even family, x, 157
  - $EO_4$ , 115, 157
    - series expansion, 161
    - shift operator, 158
  - connection coefficient, 157
    - generalized, 159
  - reducibility, 157, 161
- formal adjoint, 41, 42
- fractional derivation, 5
- Fuchs relation, 20, 34, 36, 72
- Fuchsian differential equation/operator, 19
  - dual, 41
  - locally non-degenerate, 89
  - normal form, 39
  - normalized, 32
  - universal operator, 63, 176
    - fundamental, 78
- gauge transformation, 2
- Heun's equation, 21, 50, 60
- hypergeometric equation/function
  - Appell, 186
    - $F_1$ , 186
    - $F_2$ , 191
    - $F_3$ , 190
    - $F_4$ , 188
  - confluence, 187
- Gauss, ix, 6, 83, 112
  - confluence, 24
  - Euler transformation, 84
  - exceptional parameter, 21
  - integral expression, 84
  - reducibility, 105
  - versal, 24
- generalized, xiii, 150
  - connection coefficient, 136, 154
  - contiguity relation, 153, 154
  - integral expression, 151
  - local solution, 152
  - series expansion, 152
  - shift operator, 117
  - versal, 156
- imaginary root, 70
- indicial equation, 17
- intertwining polynomial, 114, 195
- irregular singularity, 17, 193
- Jordan-Pochhammer, 8, 99, 121, 147
  - connection coefficient, 121, 148
  - contiguity relation, 148, 149
  - exceptional parameter, 50
  - generalized, 98, 107, 182
  - integral expression, 8, 147, 149
  - series expansion, 147
  - versal, 23, 149
- Kac-Moody root system, 69
- Katz's operation, 5
- Katz's rigidity, 92
- Kummer's equation, 24
- Laplace transformation, 2, 3
- linear fractional transformation, 51
- locally non-degenerate, 89
- middle convolution, 5
- minimal expression, 74, 197
- monodromy, 20, 88
  - generator, 88
  - irreducible, 85
- isomonodromic deformation, 141, 143
- odd family, 161
  - connection coefficient, 161
  - reducibility, 162
- Okubo normal form, 13, 117
- Okubo type, 49, 116, 140, 185
  - formal adjoint, 42
  - polynomial solution, 118
- Painlevé equation, 143, 195
- parabolic cylinder function, 24
- Pell equation, 99
- Pochhammer contour, 5
- polynomial solution, 118
- positive root, 70
- real root, 70
- reduced representative, 2
- reflection, 69
- regular singularity, 17
  - local solution, 17
  - normalized, 17
- Riemann scheme, 7, 8, 26
  - generalized, 34
  - reduction, 53
- Riemann-Liouville integral, 5
- Risa/Asir, 192
- Schlesinger canonical form, 13, 86, 127
- Schlesinger transformation, 113
- Scott's lemma, 91
- series expansion, 27, 81
- shift operator, 109, 113, 158, 176
- simple reflection, 69
- simple root, 69
- Simpson's list, 143

- spectral type, *see also* tuple of partitions,  
34
- tuple of partitions, 35  
  basic, 51, 139  
  Dynkin diagram, 142  
  index of rigidity =  $-2$ , 61  
  index of rigidity = 0, 56, 60  
  index of rigidity  $\geq -6$ , 140  
  direct decomposition, 96  
  divisible, 35, 62  
  fundamental, 65  
  index, 70  
  index of rigidity, 40  
  = 0, 140  
  indivisible, 35  
  irreducibly realizable, 39  
  isomorphic, 36  
  monotone, 35  
  order, 36  
  realizable, 39  
  reduction, 52  
  rigid, 40, 143  
  (sub)maximal series, 174  
  1111,211,22, 115, 160  
  21,21,21,21, 49  
  211,211,211, 163, 164  
  211,22,31,31, 167  
  21111,222,33, 66, 143  
  22,22,22,31, 168  
  221,221,221, 168  
  831,93,93,93, 108  
  minimal series, 181–183  
  order  $\leq 4$ , 163  
  order  $\leq 8$ , 144  
  Roberts' list, 174, 183  
  Simpson's list, 143  
  Yokoyama's list, 185  
  rigid decomposition, 100  
  simply reducible, 65–67, 173  
  standard, 35  
  trivial, 35
- universal model, 63
- versal  
  addition, 22  
  operator, 23
- Weber's equation, 24
- Weyl algebra, 1
- Weyl group, 69  
  length, 74  
  minimal expression, 74
- Wronskian, 21, 131, 132, 159, 166, 196
- Yokoyama's list, 185