

Index

- additive group, 147
- adjoint representation, 170
- affine algebra, 142
- affine algebraic variety, 142
- algebraic set, 139
- algebraic torus, 155
- anti-self-dual, 55
- atlas, 69

- Borel subgroups, 178
- Borel-Weil theorem, 116
- braid group, 113
- Bruhat decomposition, 66, 119

- Campbell-Baker-Hausdorff series, 75
- Cartan decomposition, 14
- Cartan matrix, 17
- Cartan subalgebra, 12
- Cartan subgroups, 127
- Cayley parametrization, 70
- celestial sphere, 56
- characters, 95, 182
- charts, 69
- Chevalley basis, 37
- Chevalley group, 38
- classification of finite dimensional
 - irreducible \mathfrak{g} -modules, 28
- classification of finite dimensional simple
 - Lie algebras, 22
- classification of the finite simple groups, 44
- Clifford algebra, 132
- complementary series, 127
- complete, 160
- complex structures, 61, 119
- connected, 148
- constructible, 145
- coordinate ring, 142

- differential, 168
- dimension, 145

- Dirac's spanner, 76
- discrete series, 125
- dominant, 143
- dominant weight, 117
- dual numbers, 162
- Dynkin diagram, 18

- Euclidean geometry, 49
- exponential map, 73

- flag, 175
- flag of type ν , 179
- flag variety, 176
- flag-manifold, 66
- function field, 142, 159
- fundamental representations, 32

- G -morphism, 172
- G -space, 172
- general linear group, 137
- Gram-Schmidt process, 63
- Grassmannian, 59, 71, 118
- Grassmannian, isotropic, 61

- Heisenberg group, 50, 83, 128, 131
- highest weight vector, 115
- Hilbert's fifth problem, 72
- holomorphically induced representation,
 - 106, 116
- homogeneous coordinates, 70
- homogeneous space for G , 172
- homogeneous space, functions on, 97
- homogeneous spaces, 59
- homomorphism of algebraic groups, 146

- induced representations, 105
- inner automorphism, 170
- irreducible, 141
- irreducible components, 141
- irreducible representation, 84
- isomorphism, 143

Cambridge University Press

978-0-521-49922-4 - Lectures on Lie Groups and Lie Algebras

Roger Carter, Graeme Segal and Ian Macdonald

Index

[More information](#)

190

Index

- isotropy group, 172
- isotypical part, 91
- Jacobi identity, 5, 75
- Jordan decomposition, 151
- K-finite vectors, 120
- Killing form, 15, 58
- Laplacian, 101
- lattices, 59
- left-invariant integral, 85
- linear algebraic group, 146
- locally closed, 144
- Lorentz group, 54
- Möbius transformation, 56
- manifold, 69
- matrix group, 92
- maximal compact subgroup, 63, 120
- maximal torus, 67, 180
- metaplectic group, 130
- metaplectic representation, 130
- module for a Lie algebra, 7
- MONSTER, 44
- morphism, 143
- multiplicative group, 147
- nilpotent, 151
- nilpotent Lie algebra, 8
- Noetherian topological space, 141
- one-parameter subgroup, 73, 182
- orbit, 172
- orders of finite Chevalley group, 40
- orders of finite twisted groups, 42
- orders of the finite Suzuki and Ree groups, 44
- orthogonal group, 72, 137
- orthogonality of characters, 96
- oscillator representation, 129
- parabolic subgroups, 117, 179
- Peter-Weyl theorem, 91
- Plücker embedding, 118
- Plancherel theorem, 122
- polar decomposition, 63
- prevariety, 158
- principal series, 125
- projective, 160
- projective space, 70, 105, 117, 159
- quantum groups, 113
- quasi-projective, 160
- quaternions, 53
- quotient of G by H , 173
- radical, 154
- Radon transform, 103
- reduced echelon form, 64
- reductive, 154
- Ree groups, 43
- regular, 142
- representation of a Lie algebra, 7
- representative function, 92
- Riemann sphere, 55
- ringed space, 157
- root datum, 183
- root system, 14, 183
- Schur's lemma, 84
- self-dual, 55
- semisimple, 151, 153, 154
- semisimple group, 58
- semisimple part, 152
- separability, 164
- Siegel generalized upper half-plane, 62
- simply connected covering group, 58, 76
- singular locus, 164
- smooth, 164
- soluble Lie algebra, 9
- solvable, 154
- special linear group, 137
- special orthogonal group, 137
- spherical harmonics, 100, 105
- spin representation, 119, 132
- structure sheaf, 157
- Suzuki groups, 43
- symmetric space, 61
- symplectic group, 137
- tangent bundle, 162, 163
- tangent space, 72
- tangent vector, 162
- tensors, 110
- torus, 179
- twisted groups, 41
- unipotent, 151, 153, 154
- unipotent part, 152
- unipotent radical, 154
- unitary group, 73
- unitary representation, 84
- universal enveloping algebra, 25
- upper half-plane, 59, 125
- variety, 159, 160
- vector bundles, 105
- Verma module, 27
- Verma modules, dual, 122
- weight vectors, 115
- Weyl denominator formula, 88
- Weyl group, 16, 66
- Weyl's character formula, 30
- Weyl's dimension formula, 31
- Zariski topology, 140