

Index

- absolutely simple module, 474
- adjoint action, 148
- adjunction, 40
- algebra, 56
 - augmented, 276
 - braided commutative, 60
 - commutative, 60
 - dual to a coalgebra, 70
 - morphism, 56
 - opposite, 60
 - semisimple, 268
 - separable, 268
 - symmetric, 273
 - tensor product, 64
- alternative cointegral, 288
- antipode, 96, 110
- associative, 253
- associativity constraint, 3
- augmentation morphism, 276
- automorphism braided group, 414
- bialgebra, 89, 106
 - dual, 95
 - op-cop dual, 95
 - over a field, 91
 - super, 91
- bicomodule algebra, 168
 - twist equivalent, 169
- bilinear map, 253
- bimodule algebra, 154
- bimodule coalgebra, 161
- bosonisation process, 419
- braided bialgebra, 89
- braided group, 96
- braided Hopf algebra, 96
- braiding, 29
 - mirror-reversed, 30
 - symmetric, 31
- category, 1
 - (pre-)braided equivalent, 35
 - (pre-)braided isomorphic, 35
 - balanced, 481
 - braided, 29
 - equivalent, 16
 - isomorphic, 2
 - left (right) rigid, 40
 - monoidal, 3
 - monoidally equivalent, 22
 - monoidally isomorphic, 20
 - of G -graded vector spaces, 8
 - of bimodules, 7
 - of endo-functors, 13
 - of sets, 7
 - of vector spaces, 7
 - opmonoidally equivalent, 22
 - opposite, 4
 - pivotal, 131
 - pre-braided, 29
 - product, 2
 - reverse monoidal, 3
 - ribbon, 481
 - rigid, 40
 - sovereign, 47
 - strict monoidal, 3
 - strong monoidally equivalent, 22
 - symmetric, 31
- coadjoint coaction, 424
- coalgebra, 65, 67
 - braided cocommutative, 69
 - cocommutative, 69
 - coopposite, 68
 - dual to an algebra, 70
 - morphism, 66
 - tensor product, 69
- coassociative, 65
- cochain, 151
- cocycle, 9, 153, 335
 - abelian, 32
 - coboundary, 9
 - coboundary abelian, 32

526

cohomologous, 9
 normalized, 9
 coinvariants
 alternative, 239
 of the first type, 235
 of the second type, 239
 subalgebra of, 179
 comodule, 82
 comodule algebra, 162
 morphism, 163
 twist equivalent, 163
 comonad, 66
 comultiplication, 65, 109
 convolution
 invertible, 95
 product, 95
 copairing, 38
 corepresentation, 83
 coring, 67, 249
 defined by a module coalgebra, 250
 counit, 65, 109
 cross product
 algebra, 61
 coalgebra, 69
 degree, 8
 diagonal action, 105
 diagonal crossed product, 204
 distinguished grouplike element, 265
 division algebra, 279
 Drinfeld twist, 115
 dual quasi-bialgebra, 135
 co-quasitriangular, 421
 dual quasi-Hopf algebra, 136
 duality theorem, 223
 endomorphism module algebra, 188
 enveloping algebra braided group, 418
 faithful module, 299
 Frobenius
 algebra, 255
 augmented algebra, 277
 element, 255
 morphism, 255
 system, 255
 function algebra braided group, 429
 functor, 2
 (pre-)braided monoidal, 35
 left (right) dual, 47
 braided equivalence, 35
 corestriction of scalars, 85
 equivalence, 16
 essentially surjective, 17
 forgetful, 103
 full image, 2
 fully faithful, 17

Index

identity, 2
 inverse, 2
 isomorphism, 2
 monoidal, 18
 monoidal equivalence, 22
 opmonoidal, 18
 opmonoidal equivalence, 22
 quasi-monoidal, 103
 restriction of scalars, 81
 ribbon, 495
 rigid quasi-monoidal, 128
 strict monoidal, 19
 strong monoidal, 19
 strong monoidal equivalence, 22
 switch, 3
 gauge transformation, 110, 136
 generalized diagonal crossed product, 201
 generalized smash product, 186
 graded
 algebra, 57
 coalgebra, 67
 quasialgebra, 57
 quasicoalgebra, 67
 group
 algebra, 9
 cohomology, 9
 grouplike element, 119
 Haar integral, 269
 Hexagon Axiom, 29
 higher representability assumption
 for comodules, 423
 for modules, 409
 homogeneous element, 8
 Hopf algebra, 96, 110
 dual, 100
 over a field, 96
 super, 96
 Hopf bimodule, 196
 Hopf crossed product, 336
 hyperplane, 254
 injective module, 260
 invariance under twisting
 for biproduct, 378
 for L-R-smash product, 219
 for ribbon element, 504
 for smash product, 180
 for two-sided smash product, 193
 iterated generalized smash product, 194
 Knizhnik–Zamolodchikov equation, 146
 L–R-smash product, 214
 left center of a category, 309
 left cointegral, 280
 left dual, 40
 left integral, 261

- left weak center of a category, 309
- linear
 - dual basis, 41
 - dual space, 40
- mate of a morphism, 51
- mixed double product, 142
- modular element, 265, 289
- module, 78
- module algebra, 147, 148
- module coalgebra, 154, 155
- monad, 57
- morphism
 - graded, 8
 - left (right) transpose, 44
 - of braided Hopf algebras, 97
- Nakayama automorphism, 257
- natural transformation, 2
 - Godement product, 14
 - horizontal composition, 14
 - identity, 13
 - isomorphism, 2
 - monoidal, 21
 - monoidal isomorphism, 21
 - opmonoidal, 21
 - vertical composition, 13
- non-degenerate
 - bilinear map, 253, 254
 - element, 280
- normalized 3-cocycle, 109
- normalized cointegral, 453
- normalized integral, 269
- pairing, 38
 - exact, 38
- Pentagon Axiom, 3
- pivotal structure, 131
- pre-braiding, 29
- projective module, 270
- quantum dimension, 462
- quantum double, 330
- quasi-bialgebra, 106
 - balanced, 497
 - biproduct, 377
 - isomorphism, 108
 - morphism, 108
 - projection, 371
 - quasitriangular, 382
 - triangular, 383
 - twist equivalent, 108
 - unimodular, 261
- quasi-commuting pair of coactions, 176
- quasi-Hopf algebra, 110
 - biproduct, 377
 - factorizable, 433
 - involutory, 472
 - isomorphism, 115
 - morphism, 115
 - projection, 371
 - ribbon, 497
 - sovereign, 134
 - trace formula, 469
- quasi-Hopf bimodule, 225, 226
 - datum, 226
 - dual, 231
 - morphism, 225
- quasi-Hopf ideal, 123
- quasi-Hopf subalgebra, 299
- quasi-ribbon element, 501
- quasi-smash product, 185, 186
- R-matrix, 382
- reassociator, 109, 135
- reconstruction theorem
 - braided, 414
 - dual braided, 423
 - for quasi-bialgebras, 104
 - for quasi-Hopf algebras, 128
- representability assumption
 - for comodules, 423
 - for modules, 407
- representation, 78
- representation-theoretic rank, 462
- ribbon element, 501
- right center of a category, 307
- right cointegral, 287
- right dual, 40
- right integral, 261
- right weak center of a category, 305
- ring, 57, 246
- Schrödinger representation, 346
- separability element, 268
- sigma notation
 - for coalgebras, 67
 - for comodules, 84
- smash product, 177, 184
- smash product coalgebra, 368
- strictification, 25
- structure theorem
 - comodule algebras, 247
 - quasi-Hopf bimodules, 235, 238, 240
- subcategory, 2
 - full, 2
- Sweedler cohomology, 335
- Sweedler notation, 67
- switch map, 169
- tensor category, 54
- tensor product, 3
- theorem
 - Eilenberg and Nakayama, 278
 - Kohn, 146

528

Krull–Schmidt, 299
 Mac Lane, 28
 Maschke, 269
 Nichols–Zoeller, 302
 Wedderburn, 279
 trace, 256, 274
 Triangle Axiom, 3
 trivial action, 178
 twist, 110, 136, 481
 twisting, 136
 quasi-bialgebras, 108
 twisting morphism, 61
 two-sided coaction, 170
 twist equivalent, 170
 two-sided crossed product, 191
 two-sided generalized smash product, 192
 two-sided smash product, 193
 two-sided two-sided Hopf module, 353
 unit constraint
 left, 3
 right, 3

Index

unit object, 3
 Universal Property
 two-sided smash product, 214
 cross product algebra, 63
 diagonal crossed product, 211
 of the category $\mathcal{B}_1(\mathcal{C})$, 495
 right center, 307
 smash product, 182, 213
 vector space
 graded, 8
 super, 11
 weakly braided
 cocommutative, 414
 commutative, 429
 Yang–Baxter equation
 categorical, 34
 quasi-, 382
 Yetter–Drinfeld datum, 325
 Yetter–Drinfeld module, 310, 325,
 355