
Index

- affine plane, 20
 - coordinatized, 23
 - order, 21
- automorphism
 - design, 40
- bases
 - mutually unbiased, 263
- binary sequence
 - autocorrelation, 255
 - correlation, 254
 - pseudorandom, 256
- binary sequence of period v , 253
- block
 - repeated, 12
- block design, 15
 - balanced incomplete, 15
- Bruck-Ryser-Chowla Theorem, 72
- Burnside's Lemma, 40
- centralizer, 40, 269
- character, 198
 - degree, 198
 - Fundamental Theorem, 203
 - irreducible, 198
 - orthogonality relations, 224
 - sum, 199
 - trivial, 198
- character table, 228
- class equation, 109
- class function, 202
 - space of, 202
- code
 - linear, 261
- commutator, 269
- commutator subgroup, 220, 269
- complete graph, 15
- conjugacy class, 269
- conjugation, 38
- coordinatized projective plane, 32
- cyclotomic classes, 149
 - order, 149
- cyclotomic field, 235
- cyclotomic integers, 235
- design
 - automorphism, 40, 94
 - block, 15
 - complement, 17
 - complete, 15
 - isomorphic, 67
 - parameters, 16, 26
 - symmetric, 26
 - t -design, 14
- difference list, 108
- difference set, 46
 - complement, 60
 - cyclotomic, 144
 - development, 54
 - equivalent, 65

- Hadamard, 112, 138, 155
 Hall family, 148, 150
 McFarland, 129
 Menon, 138, 159
 normalized, 53
 offset, 49
 order, 47
 Paley, 49, 144
 Paley-Hadamard, 138, 141
 parameters, 47
 partial, 144
 relative, 265
 residue, 144
 reversible, 92
 semi-regular relative, 265
 shift, 49
 Singer, 121, 145
 translate, 49
 trivial, 47
 twin prime powers, 51, 145
 dihedral group, 48
 Dillon's dihedral trick, 116
 diophantine equation, 72

 elementary abelian 2-group, 89
 Euler phi function, 238
 evaluation map, 107
 exponent bound, 112, 162, 247
 exponent of a group, 269

 Fano plane, 5, 41
 Fermat's Last Theorem, 235
 field
 construction, 270
 cyclotomic, 235
 four squares theorem, 77

 Gaussian integers, 194
 generalized dihedral extension, 116
 Gram-Schmidt, 185
 group
 dihedral, 48
 quaternion, 228
 group action, 37
 regular, 39, 55
 transitive, 39
 group of units, 270
 group presentation, 48
 group ring, 60
 integral, 59

 Hadamard matrix, 135, 141
 equivalent, 136
 normalized, 136
 order, 135
 regular, 138, 155
 Hall polynomial, 63
 hyperplane, 33, 268

 ideal
 prime, 237
 principal, 237
 unique factorization, 237
 incidence matrix, 12
 incidence structure, 11
 isomorphic, 13
 simple, 12
 inclusion-exclusion, 271
 inner product
 class functions, 202
 complex, 184
 standard, 183
 integral group ring, 59
 intersection numbers, 105
 intertwining transformation, 210
 invariant subspace, 170
 inversion formula, 225

 Klein-four group, 179, 191
 Kronecker delta, 229
 Kronecker product, 137

 Lagrange's Theorem, 77
 Legendre's Theorem, 73
 Lehmer's Lemma, 151

 Maschke's Theorem, 182, 188
 matrix
 equivalent, 78
 trace, 42
 unitary, 185
 McFarland difference sets, 129
 Menon construction, 159
 Mersenne primes, 145
 multiplier, 88
 left, 88
 numerical, 89
 orbit, 97

- Multiplier conjecture, 91
- Multiplier Theorem
 - First, 91
 - Second, 91
- multiset, 2, 46

- octic residues, 98
- orbit, 38
- orbit-stabilizer theorem, 39
- order
 - affine plane, 21
 - cyclotomic classes, 149
 - difference set, 47
 - Hadamard matrix, 135
 - projective plane, 31
 - symmetric design, 27
- orthogonal complement, 185

- parallel, 20
- partial difference set, 144
- projective plane, 30
 - coordinatized, 32
 - duality, 31
 - order, 31
- projective space, 33
 - coordinatized, 33

- quadratic residues, 27, 28, 49
- quartic residues, 50

- representation
 - degree, 168
 - direct sum, 181
 - equivalent, 177, 205, 210
 - faithful, 168
 - irreducible, 171
 - left regular, 175
 - linear, 168
 - natural, 168, 173
 - reducible, 171
 - regular, 175, 205
 - restriction, 182
 - right regular, 175
 - trivial, 169
- residues
 - e th power, 149
- root of unity, 270
 - primitive, 270

- Schur's Lemma, 211
- self-conjugate, 114
- set
 - s -set, 14
- square-free integer, 73
- stabilizer, 38
- Steiner system, 15
- structure theorem, 268
- subspace
 - G -invariant, 170
 - invariant, 170
 - stable, 170
 - trivial, 170
- Sylow p -subgroup, 269
- Sylow theorems, 269
- symmetric design, 26
 - complement, 28
 - order, 27
 - parameters, 26
 - trivial, 27

- t -design, 14
- trace, 42, 267
- transformation
 - intertwining, 210
 - unitary, 185
- Turyn's construction, 125
- twin primes, 51, 53, 92, 145

- unique factorization domain, 235
- unitary matrix, 185
- unitary transformation, 185

- vector
 - length, 184
 - orthogonal, 184
- vector space
 - direct sum, 180, 181

- Witt's Cancellation Theorem, 80