additive chain, 82
  top-, 91
additive eigenvector, 120
additively
  homogeneous map, 17
  subhomogeneous map, 17
admissible array, 225
  minimal, 235
  period of, 226
  restricted, 249
  sub-array of an, 226
almost Archimedean cone, 258
anti-chain, 83
array, 225
attractor, 59
Axiom I, 74
Axiom II, 74
Banach’s contraction theorem, 67
  base point, 70
Birkhoff contraction ratio, 31, 264
Birkhoff–Hopf theorem, 264
Bonsall cone spectral radius, 107
Boolean map, 88
  bottom function, 35
  Bushell’s equation, 16
Çalka’s theorem, 62
Collatz–Wielandt number, 118
  comparable, 217
  compatibility condition, 167
  complements condition, 173
  complete sequence, 224
  condition G, 99
  condition L, 148
  condition U, 148
cone, 3
  almost Archimedean, 258
  closed, 3
dual, 3
  Lorentz, 3
  minihedral, 9
  normal, 10, 45
  polyhedral, 3
  simplicial, 9
  solid, 3
  standard positive, 3
  strictly convex, 9
cone spectral radius, 107, 279
  Bonsall, 107, 279
  continuous, 115
cone spectrum, 101
cone-linear map, 278
correction, 30
  Lipschitz, 30
  contractive perturbation, 127
  converge at infinity, 71
  convergence from above, 97
  cross-ratio, 28
  metric, 28
  cycle time, 18
DAD problem, 162
  classic, 176
  generalized, 163
  solution, 163
digraph associated with \( f \), 131
direct sum, 178
dominate, 7
dual cone, 3
eigenvalue, 101, 285
equivalent sequences, 71
exposed face, 3
extreme pair, 83
top-, 92
extreme point, 34
face, 3
exposed, 3
improper, 3
proper, 3
facet, 3
defining functionals, 4
fixed point, 58
locally attracting, 68
Fréchet derivative, 11
Fréchet differentiable, 11
Frobenius normal form, 297
Frobenius–König theorem, 177
fully indecomposable matrix, 179
geodesic, 49
path, 49
space, 49
uniquely, 51
Gromov product, 198
height, 217
Hilbert’s metric, 26
homogeneous map, 13
additively, 17
of degree \( p \), 13
Hopf oscillation ratio, 263
horoballs, 71
horofunction, 71
horofunction boundary, 71
horospheres, 71
hyperboloid model, 40
\( i \)-chain, 82
improper face, 3
incidence matrix, 154
index of cyclicity, 2, 295
infimum, 9, 217
integral-preserving map, 23
irreducible
linear map, 4
matrix, 2
irreducible element of a lower semi-lattice, 218
isometry, 30
top, 55
 Karlsson–Nussbaum conjecture, 200
Klein’s model, 38
Kreĭn–Rutman condition, 143
Kreĭn–Rutman theorem, 5
\( \ell_1 \)-norm, 56
Löwner’s theorem, 16
lattice, 214
generated, 215
homomorphism, 215
length, 82, 91
limit set, 196
Lipschitz contraction, 30
locally attracting fixed point, 68
locally convex, 124
locally strongly order-preserving map, 147
log-exp transform, 18
Lorentz cone, 3
lower bound, 217
lower semi-lattice, 214
generated, 214
homomorphism, 214
LYM inequality, 83
max-plus
map, 18
semi-ring, 18
maximal tight subset, 86
mean
\((r, \sigma)\), 14
arithmetic, 14
Gauss arithmetic-geometric, 13
geometric, 14
harmonic, 14
median, 213
closed, 214
minihedral cone, 9
monotone norm, 10
multiplication operator, 163
non-expansive, 30
top, 55
nonnegative matrix, 1
norm
\( \ell_1 \)-, 56
monotone, 10
order-unit, 46
polyhedral, 89
strictly convex, 79
strictly monotone, 79
sup-, 25
Index

normal cone, 10, 45
normality constant, 10, 45
Nussbaum conjecture, 86

ω-limit set, 58
orbit, 58
order-preserving map, 6
order-reversing map, 6
order-unit norm, 46
oscillation, 257

partial order
induced by cone, 4
partly decomposable matrix, 179
parts of a cone, 7
pay-off vector, 20
period
of a map, 58
of a periodic point, 58
of an admissible array, 226
periodic
orbit, 58
point, 58
permanent, 177
permutation equivalent matrices, 179
Perron’s theorem, 2
Perron–Frobenius theorem, 2
Poincaré ball model, 40
policy, 21
polyhedral
cone, 3
norm, 89
positive
diagonal, 161
matrix, 1
vector, 2
primitive linear map, 153, 285
projective diameter, 31, 260
proper face, 3
proper metric space, 62

quotient map, 184
reachable, 249
recession map, 135
reducible matrix, 2
restricted admissible array, 249
retraction, 77
Riccati equation, 17
row allowable matrix, 281

same zero pattern, 154
sand-shift map, 24
with rule γ, 230
scrambling matrix, 172, 281
semi-derivative, 124
semi-differentiable map, 124
semi-lattice, 214
Shapley operator, 21
simplicial cone, 9
slice space, 135
solid cone, 3
spectral radius, 2
spectrum, 2, 284
Sperner’s theorem, 90
standard positive cone, 3
Stein’s equation, 17
strategy, 20
strictly convex norm, 79
strictly monotone norm, 79
strongly connected digraph, 131
strongly order-preserving map, 6
locally, 147
sub-array of an admissible array, 226
sub-eigenspace, 135
sub-topical map, 17
sub-homogeneous map, 13
additively, 17
strictly, 13
sup-norm, 25, 34
sup-norm decreasing map, 25
super-additive map, 140
super-eigenspace, 134
support, 14
supremum, 9, 217

Thompson’s metric, 30
tight subset, 86
top
function, 35
isometry, 55
non-expansive, 55
topological map, 17, 55
topological vector space, 256
totally disconnected digraph, 158
transitive group, 65

upper bound, 9, 217
value iteration, 19
value of a game, 21
variation norm, 36