

Index

- φ
 - matrix of, 22
- adapted to the decomposition, 15
- adjoint transformation, 20
- affine, 39
- algebraic dual space, 11
- algebraic multiplicity, 48
- Banach space, 33
- basis, 8
 - change of, 9
 - dual, 12
 - Hamel, 8
 - standard, 8
- bilinear form, 21
- blocks
 - Jordan, 57
- bounded
 - pointwise, 108
- bounded linear functionals, 37
- bounded linear operator, 27, 37
- Cauchy-Schwarz inequality, 30
- change of basis, 9
- characteristic polynomial, 48
- codimension, 10
- combination
 - linear, 8
- compatibility conditions, 21
- complementary subspaces, 15
- completion, 35
- composition operator, 13
- condition number, 46
- conditions
 - compatibility, 21
 - initial, 100
- conjugate-linear, 23
- constant
 - Lipschitz, 103
- continuous
 - locally Lipschitz, 112
- continuous linear functionals, 11
- contraction, 102
- convex combination, 32
- convex subset, 31
- coordinates, 8
- decomposition
 - adapted to the, 15
 - partial fractions, 83
- deflation, 53
- dependent
 - linearly, 8
- diagonalizable, 48
- differential operator, 13
- dimension of V , 8
- dimensional
 - finite, 28, 32
- direct, 10
- direct products, 10
- direct sums
 - external, 10
- dual basis, 12
- dual norm, 38
- dual transformation, 20
- eigenspaces
 - generalized, 59
- eigenvalue, 48
- eigenvectors, 48
 - generalized, 59
- equation
 - integral, 101
- equicontinuous, 107
- equivalent

- unitarily, 52
- equivalent norms, 28
- error
 - relative, 46
- error vector, 46
- external direct sums, 10
- factorization
 - LU, 75
- family of matrix norms, 44
- finite dimensional, 28, 32
- finite sum, 8
- fixed point, 102
- fixed-point iteration, 102
- form
 - bilinear, 21
- functional
 - linear, 11
- functional iteration, 102
- functionals
 - bounded linear, 37
- generalized eigenspaces, 59
- generalized eigenvectors, 59
- geometric multiplicity, 48
- Hamel basis, 8
- Hermitian, 22
- Hermitian part, 49
- Hilbert space, 33
- hyperplane, 39
- hyperplanes
 - affine, 39
- idempotent, 15
- ill-conditioned, 46
- independent
 - linearly, 8
- initial conditions, 100
- inner product, 22
- integral equation, 101
- integral operator, 13
- isomorphism, 9
- iteration
 - fixed-point, 102
 - functional, 102
- iterative, 78
- Jordan blocks, 57
- Jordan normal form, 57
- kernel, 13
- left singular vectors, 64
- linear combination, 8
- linear functional, 11
- linear functionals
 - bounded, 37
 - continuous, 11
- linear operator
 - bounded, 27, 37
- linear space
 - normed, 25
- linear transformation, 8
- linearly dependent, 8
- linearly independent, 8
- Lipschitz constant, 103
- locally Lipschitz continuous, 112
- LU factorization, 75
- matrices
 - orthogonal, 51
- matrix
 - similar, 14
- matrix norms
 - family of, 44
- matrix of φ , 22
- Minkowski's inequality, 25
- multiplicity
 - algebraic, 48
 - geometric, 48
- multiplier operator, 13
- nilpotent, 16
- norm, 25
 - dual, 38
 - operator, 28
- Norm Equivalence Theorem, 37
- norm ratio, 27
- normed linear space, 25
- norms
 - equivalent, 28

- number
 - condition, 46
- operator
 - bounded linear, 37
 - composition, 13
 - differential, 13
 - integral, 13
 - multiplier, 13
- operator norm, 28
- orthogonal matrices, 51
- orthogonal projection, 24, 59
- partial fractions decomposition, 83
- point
 - fixed, 102
- pointwise bounded, 108
- polynomial
 - characteristic, 48
- positive semi-definite, 49
- product
 - inner, 22
- products
 - direct, 10
- projection, 15
 - orthogonal, 24, 59
- property
 - uniform, 33
- radius
 - spectral, 48
- ratio
 - norm, 27
- relative error, 46
- relative residual, 46
- residual
 - relative, 46
- residual vector, 46
- resolvent, 81
- resolvent set, 81
- right singular vectors, 64
- sesquilinear, 22
- set
 - resolvent, 81
- similar matrix, 14
- singular values, 62
- skew-Hermitian, 49
- space
 - Banach, 33
 - Hilbert, 33
- span of S , 8
- spectral radius, 48
- spectrum, 48
- standard basis, 8
- submultiplicative, 37
- subset
 - convex, 31
- subspace, 6
- subspaces
 - complementary, 15
 - sums of, 10
- sums of subspaces, 10
- symmetric, 22
- transformation
 - adjoint, 20
 - dual, 20
 - linear, 8
- uniform property, 33
- uniformly Lipschitz continuous with respect to x , 103
- unitarily equivalent, 52
- unitary, 50
- upper-Hessenberg form, 78
- values
 - singular, 62
- vector
 - error, 46
 - residual, 46
- vectors
 - left singular, 64
 - right singular, 64
- well-conditioned, 46