

- linear map, 1103
- nodes, *see* vertex
- nondegenerate, 1473
  - symmetric bilinear form, 453
- non-Euclidean geometries, 947
- nondegenerate pairing
  - induced linear maps, 1145
  - of vector spaces, 1145
- norm, 325, 440, 443, 445, 463, 523
  - 1-norm, 326
  - $\ell^2$ -norm, 54
  - $\ell^p$ -norm, 326
  - dual, 542
  - equivalent, 334
  - Euclidean, 54, 326
  - Frobenius, 441
  - matrix, 337
  - nuclear, 545
  - parallelogram law, 446
  - quadratic norm, 336
  - subordinate, 343
  - sup-norm, 326
  - triangle inequality, 325
- normal
  - matrix, 765
- normal cone, 1833
- normal equations, 479, 757
  - definition, 757
- normal linear map, 457, 611, 619, 621
  - definition, 612
- normal matrix, 337
- normalized cuts, 718
- normalized Haar coefficients, 153
- normalized Haar transform matrix, 153
- normed vector space, 325, 523, 1359
  - 1-norm, 326
  - $\ell^p$ -norm, 326
  - absolutely summable, 2121
  - Cauchy family, 2112
  - complete, 362
  - Euclidean norm, 326
  - norm, 325
  - summable family, 2112
  - sup-norm, 326
  - triangle inequality, 325
- nuclear norm, 545
  - matrix completion, 547
- null linear map, 823
- null set of an affine map, 833
- nullity, 191
- nullspace, *see* Kernel
- one-sided directional derivative, 1842
  - connection to subgradient, 1845
- open
  - ball, 1370
  - cover, 1353
  - subcover, 1353
- open set, 335
- operator norm, 343, *see* subordinate norm
  - $\mathcal{L}(E; F)$ , 348
- optical axis, 947
- optimization
  - constraints, 1670
  - functional, 1670
  - linear, *see* linear programming
  - nonlinear, 1670
- optimization problem
  - equality constraints, 1461
  - feasible solution, 1460
  - inequality constraints, 1461
- optimization problems, 755
- ordered basis, 1202
- ordinary convex program, 1859
  - dual function, 1861
  - feasible solutions, 1859
  - qualified constraint, 1860
  - zero duality gap, 1862
- ordinary convex programs, 1859
- orientation of the plane, 938
- oriented vector space, 1214
  - negatively oriented, 1214
  - positively oriented, 1214
- origin, 791, 792, 798