

- force, 792, 797
- forward-substitution, 251
- Fourier analysis, 441
- Fourier coefficient, 2111
- Fourier coefficients, 1648
- Fourier matrix, 533
- Fourier series, 1648, 2112
 - Bessel inequality, 2115
 - partial sum, 2112
- Fréchet derivative, *see* derivative of linear map
- frame, 792
 - projective, 868
- frame invariance, 796
- frame invariant properties, 793
- free module, 89
- free variables, 295
- free vector, 792, 796, 797
 - definition, 797
- free vector space generated by I , 1153
 - construction, 1154
 - universal mapping property, 1154
- Frobenius norm, 340, 441, 519
- from polar form to SVD, 743
- from SVD to polar form, 743
- Fulton, 862
- fundamental theorem of projective geometry, 886
- Gallier, 837
- Gauss, 479, 755
- Gauss–Jordan factorization, 297
- Gauss–Seidel method, 1688
- Gaussian elimination, 251, 252, 257
 - complete pivoting, 277
 - partial pivoting, 277
 - pivot, 253
 - pivoting, 253
- general ℓ^1 -regularized loss minimization, 1899
 - ADMM form, 1899
- general linear group
 - vector space, 99
- generalized eigenvector, 1088, 1103
 - index, 1103
- generalized Lagrange multipliers, 1745, 1775
- generalized Lasso regularization, 1901
 - ADMM form, 1901
- generalized Newton method, 1490
- geodesic dome, 729
- Gergonne, 930
- Gershgorin disc, 567
- Gershgorin domain, 567
- Gershgorin–Hadamard theorem, 569
- Givens rotation, 666
- Golub, 1524
- gradient, 454
- gradient ∇f_u , 1672
- gradient descent method, 1688
 - backtracking lines search, 1689
 - conjugate gradient method, 1705
 - extrapolation, 1698
 - fixed stepsize parameter, 1689
 - momentum term, 1700
 - Nesterov acceleration, 1701
- Newton descent, 1701
 - feasible start, 1757
 - infeasible start, 1757
 - Newton decrement, 1701
 - Newton step, 1701
- Newton’s method, 1702
 - damped Newton phase, 1703
 - pure Newton phase, 1703
 - quadratically convergent phase, 1703
- normed steepest descent, 1699
 - ℓ^1 -norm, 1700
 - ℓ^2 -norm, 1700
 - Newton descent, 1701
 - symmetric positive definite matrix, 1700
- optimal stepsize parameter, 1689
- scaling, 1698
- variable stepsize parameter, 1689
- Gram–Schmidt
 - orthonormalization, 472, 529
 - orthonormalization procedure, 459
- graph
 - bipartite, 236