

Index

- Abel, ix, x, 11, 21, 25, 30, 33, 62, 121, 232, 276, 279, 338
- addition
 formula, 30, 32
 theorem, 132, 268
- argument principle, 71
- arithmetic–geometric mean, 357
- Atkin, 177
- automorphism of a lattice, 69
- basis
 canonical, 67
 module, 64
- Bernoulli
 lemniscate, 276
 numbers, 174
- beta function, 49
- binary quadratic form, 319, 321
- Birch–Swinnerton-Dyer conjecture, 274
- Bowman, xi, 11, 27
- Bring’s form, 280, 283
- canonical basis, 67
- Cardan, 277
- Carroll, Lewis, 42
- Cayley, 17
- class of quadratic forms, 319
- complementary modulus, 11, 56
- complete elliptic integral, 130
- complex multiplication, 66
- correlation
 and elliptic functions, 353
 coefficient, 353
- Cox, 357
- cryptology, 233, 269, 272
- crystallographic restriction, 60
- cubic
 curve, 271
 equation, 277
- Davenport, 53, 331
- Dedekind eta function, 151, 284
- Deligne, 273
- depressed equation, 315
- determinant (discriminant), 319
- diffeomorphism, 9
- diffusion (heat) equation, 86
- Diophantine geometry, 273
- Dirac delta distribution, 367
- discriminant, 170, 171, 319, 321
- duality principle, 256
- Eberlein
 Eisenstein series, 173
- elliptic, 11, 30
 curve, 233, 269
 function, x
 function, principal parts, 189
 function field, 188
 integral, 11, 12, 21, 129, 212
 modular function, 136, 138
 order of elliptic function, 71
- ellipsoid, surface area, 241
- equianharmonic case, 164
- equivalent quadratic forms, 319
- eta function, 129, 152
- Euler, 11, 30, 338
 dynamical equation, 339
 normal equation, 8
 pentagonal number formula, 92
 product
 substitution, 10

- expectation, 353
- Fagnano, 21, 232, 233, 236, 237, 338
 - point, 236
 - substitution, 50
- Fatou set, 364
- Fermat
 - Last Theorem, 275
 - Little Theorem, 233
- Ferrari, 277
- Fourier series, 51
- Frey curve, 275
- fundamental domain, 307
- Galois
 - group, 279
 - theory, 276
- Gauss, 8, 21, 30, 55, 62, 114, 232, 276, 319, 338, 357, 362
- genus, 274
- Glaisher, 50
 - notation, 46, 217
- Green's function
 - heat flow, 367
 - rectangle, 350
- Greenhill, ix
- group law, 233, 268, 270, 271, 272
- Halphen, 247
- Hardy, 30
- harmonic case, 164
- Hasse, 273
- heat (diffusion) equation, 86, 97, 98, 366
- Hermite, 276, 320
- herpolhode cone, 340
- homeomorphism, 24
- hypergeometric function, 113
- icosahedral group, 284
- inversion problem, 108, 204, 206
- Jacobi, ix, x, 55, 62, 75, 86, 88, 89, 128, 133, 178, 247, 338
 - elliptic functions, x, 15, 25, 45, 56, 62, 107, 215
 - eta function, 129
 - identity, x, 91, 100
 - imaginary transformation, 29, 95, 143
 - normal form, 8, 10
 - 'remarkable identity', 84
 - theta function, 368
 - triple product identity, 92
 - zeta function, 131
- Julia set, 364
- Kelvin method of images, 98, 367
- Kendall, 353
- Klein, 276
- Kronecker, 319
- Lagrange, 128
- Lambert
 - series, 331, 336
- Landen
 - point, 250
 - transformation, 99
- lattice, 41
 - automorphism
- Laurent expansion, 165
- Lawden, 338
- Legendre, 30, 131
 - normal forms, 211, 220
 - relation, 133
 - standard forms, 210
- lemniscate, 22, 276, 357
 - function, 46
 - integral, 11, 46
- Liouville's theorem, original form, 70
- Littlewood, 247
- Maclaurin expansion, 21
- modular
 - equation, 284, 285, 300, 312
 - form, 153, 170
 - function, dimension of, 170
 - function, elliptic, $j(t)$, 171, 203
 - function, elliptic, $l(t)$, 136, 203, 204
 - function, *the*, $j(t)$, 171
 - function, weight, 170
 - group, 145
- module, discrete, 64
- modulus, 11, 285
 - complementary, 11
- monodromy theorem, 124
- Mordell–Weil theorem, 274
- multiplicative constant, c , 79
- multiplier, 77
- nine (or seven) circles theorem, 260
- normal form, 211, 220, 229
 - of quintic equation, 280
- numerical evaluation of elliptic functions, 119
- O'Brien, 177
- order of elliptic function, 71

- oscillatory motion, 2
- osculating plane, 246
- parallelogram, fundamental, 41
- partitio numerorum, 92
- partition function, 93
- pendulum, 1
- pentagonal numbers identity, 93, 94
- perihelion of Mercury, 343
- period
 - imaginary, 18
 - lattice, 42, 62
 - module, 62
- periodic
 - doubly, 18
 - properties, 39
- periodicity factors, 77
- periods, 18
- planetary orbits, 342
- Poe, Edgar Allen, 24
- polar triangle, 256
- polhode cone, 340
- Polya, x, 23, 33
- Poncelet poristic polygons, 232, 247
- prime numbers, distribution of, 369
- pseudo-addition formula, 86
- pseudo-periodicity
 - sigma function, 161, 163
 - zeta function, 161, 162, 163
- quadratic form, 319
- quartic equation, 277
- quintic equation, 153, 276, 280, 314
- Ramanujan, 247
 - function, 179
 - numbers, 181
- random walk, 22
- rational map, 364
- reduction of elliptic integral, 219
- residues, 43
- Riemann Hypothesis, 369
 - for function fields, 273
- Riemann–Roch Theorem, 191
- Riemann zeta function, 174, 366, 369
- root function, $f_\alpha(z/\tau)$, 125, 143, 154, 178
- Seiffert
 - spherical spiral, 259
 - spiral, 232, 259
- Siegel, 49
- simple pendulum, 1
- space curves, 245
- special choices (for circles), 261
- spherical
 - pendulum, 345
 - triangle, 255
 - trigonometry, 255, 256
- square lattice, 69
- sticking solution
- sums
 - of four squares, 125
 - of three squares, 318
 - of two squares, 51
 - of triangular numbers, 318
- symmetric group, 279
- Tartaglia, 277
- Taylor, 275
- theta functions, x, 26, 75, 103
 - notation, 83
 - the functions $f(t)$, $f_1(t)$, $f_2(t)$
- transformation problem, 145
- triangular lattice, 69
- Tschirnhaus, 261
- two-dimensional time, 42
- unimodular
 - group, 64
 - substitution, 319
 - transformation, 138, 145
- Uniqueness Theorem, 13, 38, 39, 84
- Vieta, 277
- Wallis
 - formula, 23
 - product
- Watson, 54
- Weber, 276
- Weierstrass, ix, 26, 62
 - elliptic function, 72, 125, 138, 160
 - normal form, 229
 - numbers, 125
 - sigma function, 156, 158
 - zeta function, 156, 159
- weight (of modular function), 170
- Weil, 27
- Whittaker, 19
- Wiles, 275
- zeta function
 - Jacobi, 131
 - Riemann, 174, 274, 366
 - Weierstrass, 156, 159