INDEX

The numbers refer to the pages

Addition rule in probability, 316
Addition theorems, 12
Advancing difference formula, 51, 61
Aitken, A. C., 131
Algebraic function, 134
Alison, S. H., 32
Angle, complementary, 10
definition of, 1
magnitude of, 6
negative, 4
Approximate integration, 285
Approximation, successive, 89
Areas of curves, 271
Argument, 25
Asymptote, 147
Average rate, 136

Backward formula, Gauss, 71, 126
Bernoulli, 312
Bernoulli's numbers, 185
Bessel's formula, 71
Beta function, 270
Binomial theorem, 32
Buchanan, J., 122, 219

Calculus, differential, 150
integral, 223
Cauchy, 180
Central differences, 68, 123
Chance, 317
Change of origin, 49, 290
Change of unit, 289
Chystal, 314
definition of probability, 314
Coefficient, differential, 150
Coefficients, detached, 40, 108
Collins, John, 47
Complementary angle, 10
Compound function, 116
Constant, definition of, 22
of integration, finite differences, 104
of integration, integral calculus, 220
Constant rate, 136
Contact of the first order, 223
Continuous function, 139, 146
Convergent series, 144
Cosecant, 2
Cosine, 2
series for, 186
Cotangent, 2
Critical value, 191

D'Alembert, 332
Definite integral, 224, 262
Degree, 6
De Morgan, 332
Dependent events, 320
Dependent variable, 22
Derivative, 150
Derived function, 150
Detached coefficients, 40, 108
Difference table, 25
 Differences, central, 68
definition of, 24
divided, 57
leading, 25
Differences of zero, 114
Differential, 237
Differential calculus, 150
Differential coefficient, 150
Differential equation, 181
Differentiation, logarithmic, 161
partial, 209
successive, 162
under the integral sign, 274
Divergent series, 144
Divided differences, 57
Double angles, 14
Double integrals, 277, 357
Double limit, 145
Duration of play, 336

Elimination of third differences, 90
Entry, 25
Equation, differential, 181
Euler, 63
Eulerian integrals, 270
Euler-Maclaurin expansion, 299
Euler's theorem, 312
Everett's formula, 72, 73
Expansions, 174
Expectation, 331
Explicit function, 134
Factorial notation, 38
Finite differences, 22
Forward formula, Gauss, 69, 80, 126
Fraser, D. C., 47, 76, 77, 123, 129, 130, 219
hexagon diagram, 123
Frequency, 315
relative, 315
Function, algebraic, 134
compound, 116
continuous, 139, 146
definition of, 22
explicit, 134
first derived, 150
homogeneous, 60, 135, 212
implicit, 138
inverse, 10
parabolic, 22
periodic, 9
rational integral, 22
transcendental, 135
two variable, 118

Gamma function, 270
Gauss, backward formula, 71, 126
forward formula, 69, 80, 126
Geometrical solutions, probability, 364
Gibson’s Calculus, 208
Gradient, 152
Gregory, James, 47

Half angles, 14
Hall and Knight’s Algebra, 100
Hardy, G. H., 131
Hardy’s formulae, 205
Henry’s Calculus and Probability, 249
Hexagon diagram, 123
Homogeneous function, 212
Homogeneous products, 60, 135
Huyghens’ problem, 326

Identities, trigonometrical, 5
Implicit function, 135
Indefinite integral, 225
Independent events, 319
Independent variable, 22
Indeterminate forms, 206
Induction, method of, 333
Inflexion, point of, 196
Integral calculus, 223
Integral, definite, 224, 262
double, 277, 357
Eulerian, 270
indefinite, 225

Integration, approximate, 285
by parts, 249, 267
Interpolation, 44, 57
formulae of, 47, 58, 62, 69, 71, 72
inverse, 84
osculatory, 216
Intervals, equidistant, 44
subdivision of, 51
unequal, 57
Inverse function, 10
Inverse interpolation, 84

King, A. E., 307
King, G., 219, 296

Lagrange, form of remainder, 179
interpolation formula, 62, 122
Leading differences, 25
Leading term, 25
Leibnitz’s theorem, 164
Lidstone, G. J., 72, 77, 131, 215, 219
Limit, definition of, 140, 142
double, 145
of a sequence, 143
Limiting value, 137
Logarithmic differentiation, 161
Lubbock’s formula, 302

Maclaurin’s theorem, 179
Magnitude of angles, 6
Maximum value, 101
Mean value, 354
Mean value theorem, 176, 197
Minimum value, 101
Most probable value, 328
Multiplication rule, 319
Mutually exclusive events, 316

Negative angles, 4
Newton’s formula, advancing differences, 47, 61, 126
divided differences, 58

Operators, Δ, E, 27
δ, μ, 79
2, Δ, 104, 106
V, 127
D, Δ, 213
Origin, change of, 49, 290
Osculatory interpolation, 216

Parabolic function, 22
Partial differentiation, 209
Parts, integration by, 249, 267
summation by, 102
INDEX

Periodic function, 9
Periodicity of trigonometrical functions, 7
Poincaré, 333
Point of inflexion, 196
Probability, 313, 360
application of calculus to, 360
geometrical solutions, 364
Probable value, 331
Projection, 11

Quadrature formulae, 296

Radian, 6
Rates, 135
average, 136
constant, 136

Rational integral function, 22
Ratios, trigonometrical, 2
Recurring series, 109
Reduction formulae, 252
Relative frequency, 315
Remainder term, Taylor’s series, 179
Rolle’s theorem, 174

St Petersburg problem, 332
Schlömilch, 180
Secant, 2
Separation of symbols, 36
Sequence, limit of, 143
Series, convergent, 144
divergent, 144
recurring, 109
Sheppard, W. F., 76, 77, 79, 315
Sheppard’s rules, 73
Simpson’s rule, 286, 292, 308
Sine, 2
series for, 186
Spencer, J., 121
Sprague, Dr T. B., 219
Spurgeon’s Life Contingencies, 207
Standard forms, differential calculus, 156
integral calculus, 228
Steffensen, Prof. J. F., 60
Steffensen’s Interpolation, 93, 127
Stirling’s formula, 71, 80
Stirling’s theorem, 179

Subdivision of intervals, 51
Substitution, method of, 235
Successive approximation, 89
Successive differentiation, 162
Sum and difference formulae, 14
Summation, 97
by parts, 102
Summation n, 128
Symbolic notation, 24
Symbols, Δ, 24
8, 79
∇, 127
E, 27
Σ, 104, 105
µ, 79
D, 213
I, 244
Symbols, separation of, 36

Tangent, 2
Taylor’s theorem, 65, 177
Term, leading, 25
Thiele, 44
Three-eighths rule, 293
Todhunter, R., 131
Transcendental function, 135
Trigonometrical ratios, 2
Turning value, 191
Two variables, functions of, 118

Unitary definition of probability, 314
Unit, change of, 289

Vandermonde’s theorem, 166
Variable, definition of, 22
dependent, 22
independent, 22

Weddle’s rule, 294
Whittaker and Robinson’s Calculus of Operations, 77, 93, 307
Whitworth’s Choice and Chance, 333
Wickens, C. H., 307
Williamson’s Integral Calculus, 249
Woolhouse’s formula, 304

Zero, differences of, 114
Zig-zag formula, 70, 71