

Index

- absolute value, 65
- acceleration, 149
- adjusted trapezoidal rule, 339
 - error bound with, 339
- angle measure, 346
- antiderivatives, 194–205
 - of constant times a function, 198
 - of $\cos x$, 363
 - differ by a constant, 196
 - of exponential functions, 249, 253
 - involving trigonometric functions, 371–5
 - of $1/x$, 266
 - repeated, 202
 - of $\sin x$, 363
 - of sum of functions, 198
 - using the Chain Rule, 198, 222–4, 308–10
 - of various trigonometric functions, 364–5
 - of x^n , $n \neq -1$, 197
- averages, 320–8
- center of gravity, 326
- Chain Rule, 159, 167
 - proof of, 164
 - special case of, 159
- consumers' and producers' surplus, 315
- cost
 - average total or total unit, 121
 - fixed, 120
 - incremental, 121
 - marginal, 121, 182
- curve-fitting, 44–8, 53–6, 68, 270–4
- curves,
 - concave up (down), 152
 - derived, 149
- derivative
 - of $\arccos x$, 368
 - of $\arcsin x$, 367
 - of $\arctan x$, 369
 - of a constant times a function, 96
 - of $\cos x$, 360
 - of an exponential function, 244, 253, 268
 - of a function, 93
 - of a logarithmic function, 264, 269
 - of a product, 179
 - of a quotient, 180
- of $\sin x$, 360
- of a sum, 96
- of $\tan x$, 360
- of x^n , if n is an integer, 96
- of x^n , if n is a rational number, 173
- differential equations
 - approximate solutions (Euler method), 284, 287, 302
 - approximate solutions (Heun method), 342
 - with constant coefficients, 294, 299
 - definition of, 283
 - definition of a solution of, 283
 - with trigonometric solutions, 380–6
 - with variables separable, 286
- differentials, 176
- differentiation
 - definition of, 93
 - implicit, 172, 174, 185
 - logarithmic, 265
 - repeated, 148
- displacement, 73
- distance formula, 357
- division, synthetic, 22
- equations
 - approximate solution of (bisection method), 143
 - approximate solution of (Newton–Raphson method), 140, 142
 - differential, *see* differential equations
 - logistic, 290, 292
 - solution of higher degree, 20
 - solution of linear, 16, 139
 - solution of quadratic, 18, 139
 - solution of simultaneous linear, 16
- error, relative or percentage, 246
- exponents
 - fractional, 9
 - integral, 8
- flexion, 148
- force of attraction, 310
- formulas
 - different for different regions, 45
- exponential, 46, 233, 271
 - mensuration, 30
 - polynomial, 44
 - power law, 47, 270
- function
 - complementary, 299
 - continuous, 161
 - cosine, 349
 - decreasing (strictly), 112
 - definition of, 56
 - derived, 93
 - differentiable, 125
 - domain and range of a, 56
 - extension of a, 57
 - function of a, 60
 - implicit form of a, 171
 - increasing (strictly), 112
 - inverse of a, 62, 257
 - natural domain of a, 60
 - periodic, 343
 - restriction of a, 57
 - sine, 349
 - stationary, 113
 - tangent, 354
- functions
 - exponential, 233
 - logarithmic, 259
 - periodic, 375–9
 - products of, 60
 - sums of, 60
- Fundamental Theorem of Calculus
 - applications of, 217–22, 310–17, 329–31
 - statement of, 215
- graphs
 - with log–log scales, 269
 - with semilog scales, 269
 - with uniform scales, 34–41
- increments, 114, 165
 - approximate, 115, 116, 117
- inflection, point of, 152
- integral, 212
 - indefinite, 224
- interest, compound, 50, 80, 237–9

Index

- interpolation
 - graphical, 35
 - linear, 41
- intervals, notation for, 61
- inverse trigonometric functions, 365–71
- left-end-point rule, 335
 - error bound with, 335
- limit
 - of a constant function, 82, 87
 - of a function, 76, 85
 - of $g(u) = u$, 82, 87
 - of the product of two functions, 82, 87
 - of the quotient of two functions, 82, 87
 - of the quotient of two functions (supplement), 83
 - of a sum (integral), 205–13
 - of the sum of two functions, 82, 86
- limits, guessing with a calculator, 101
- linearization, 117
- loads, 312
- logarithms
 - common, 259
 - definition of, 27, 259
 - laws of, 27, 259
 - natural, 258
- maxima and minima, 123
 - absolute, 126
- end-point, 126
 - first test for, 127
 - relative, 126
 - second test for, 127
 - third test for, 154
 - turning-point, 126
- Mean-Value Theorem, 110
- moment of a force, 314
- numbers
 - critical, 126
 - ordered pairs of, 16
 - rational, 5
 - real, 10
- partial fractions, 291
- particular integral, 299
- polynomial
 - continuity of a, 162
 - definition of a, 20
 - limit of a, 84
- profit, 182
 - maximization of, 183
- progressions
 - arithmetic, 24
 - geometric, 25
- projectiles thrown vertically, 202–4
- quadrature, 334
- radian measure, 346
- radicals, 9
- rate(s) of change
 - average, 98, 166
 - instantaneous, 98, 166
 - related, 168, 174
 - relative (or percentage), 246
- revenue
 - gross, 182
 - marginal, 182
- scale, economies (diseconomies) of, 122
- slope
 - average, 88
 - at a point, 89
- speed
 - average, 72
 - instantaneous, 75
- tangent to a curve, 92
- trapezoidal rule, 337
 - error bound with, 338
- value, incremental and marginal, 121
- velocity
 - average, 73
 - instantaneous, 75, 77