

Index

• *Numbers & Symbols* •

< > (angle brackets) in vectors, 183
 Π (pi), 26
☐ key (secondary key function), 12
[] (square brackets) in vectors, 183
2D (two-dimensional) contour maps, 189–195
2nd key, 11–12
3D (three-dimensional) graphs
 animating, 197
 changing styles, 198
 contour maps, 189–195, 200
 converting between level curves and contour maps, 202–203
 custom contour maps, 201–202
 custom level curve graphs, 200–202
 graphing styles, 191–192, 198
 level curves, 189–195
 rotating, 196
 surfaces, 189–195
 tracing, 198–199
 viewing along a coordinate axis, 197–198
 zooming operations, 195–196

• *A* •

aborting processes, 16
absolute value (abs) function, 28
absolute value (modulus) of complex numbers, 59
accessing
 applications, 16
 CATALOG, 22
 menus, 16–17
accuracy of function graphs, 69–71

adding
 columns (data), 271
 columns to a matrix, 246–247
 matrices, 253
 polynomials, 50
 rational expressions, 50
 rows (data), 271
 rows to a matrix, 246–247
adjusting column width of a matrix, 244
ALPHA key, 13
analyzing statistical data, 280–283
and command, 39
angle brackets (< >) in vectors, 183
Angle mode, 19
angles
 common errors, 304
 converting to degrees, 54
 converting to degrees, minutes, and seconds (DMS), 53–54
 converting to radians, 54
 entering, 52–53, 304
 entering in degrees, 40
 entering in radians, 40
 units of measurement, 52–53
animate graphing style (parametric equations), 128
animating 3D graphs, 197
answers (approximate versus exact), 89
appending matrices, 247–248
Appleworks, 299
applications
 accessing, 16
 Cabri Jr., 299
 Calculus Tools, 186, 299
 CellSheet, 299
 downloading, 300–301
 exiting, 10
 Geometer's Sketchpad, 300

applications (*continued*)

- installing, 301
- keys or key combinations, 16
- license agreements, 301
- Notefolio, 300
- Organizer, 300
- quitting, 10
- Split Screen mode, 20–21
- Statistics with List Editor application, 300
- StudyCards, 300
- Symbolic Math Guide, 300
- TI Connect software, 301
- TI-Reader, 300
- TI-Reader Converter, 300
- viewing installed applications, 299

approximate answer, 89

Approximate mode, 21

Apps Desktop mode, 21

APPS key, 16

arc length

- finding, 145–146, 175
- function graphs, 102–103
- parametric curves, 145–146
- polar equations, 167–168

arcLen command, 175

arguments (functions), 304

arithmetic expressions

- combining, 33
- entering, 25–26
- evaluating, 26
- matrices, 251–253
- order of operations, 29–30
- previous answers, 30
- variables, 30–31

arithmetic operations

- complex numbers, 58
- order of, 29–30, 303–304

arrow keys (directional arrows), 11

augmenting matrices, 247–248

automatically generated tables

- functions, 83–87
- parametric equations, 136–139
- polar equations, 157–160
- sequence values, 120–124

Axes format, 119, 191

• B •

Backspace key, 14

Base mode, 21

BATT warning message, 9–10

batteries, changing, 9–10

Bound error message, 305

box plots

- creating, 274–277
- defined, 274
- tracing, 280
- whiskers, 274

brackets in vectors, 183

Break error message, 16, 305

BUSY indicator, 15

• C •

cables

- TI-Graph Link cable, 290–291, 301
- unit-to-unit Calculator Link cable, 293–294
- USB-to-USB cable, 290–291

Cabri Geometry II Plus software for Windows, 299

Cabri Jr. application, 299

Calc menu, 171–172

calculator

- batteries, 9–10
- connecting to computer, 290–291
- linking to other calculators, 293–294
- memory, 241, 249
- TI-89 model, 2
- TI-89 Titanium model, 2
- TI-92 Plus model, 2
- transferring files between calculators, 294–296
- turning on/off, 10–11
- Voyage 200 model, 2

Calculator Link cable, 293–294

Calculus Tools application, 186, 299

CAS (Computer Algebra System)

- features, 37

case-sensitivity, 13

CATALOG

- accessing, 22
- norm command, 186

- ceiling function, 28
- cells
 - deleting, 271
 - inserting, 270–271
- CellSheet application, 299
- cFactor command, 51, 60
- changing styles of 3D graphs, 198
- changing the batteries, 9–10
- characters
 - erasing, 14–15
 - inserting, 15
 - keying over, 15
- CLEAR key, 14
- clearing contents. *See also* deleting;
erasing; removing
 - of Home screen, 11, 25
 - of variables, 304
- clock, 22–23
- cobweb plots, 110–111
- columns (matrices)
 - adding, 246–247
 - adjusting column width, 244
 - deleting, 246–247
 - dimensions, 241
 - entering, 242–243
 - width, 244
- columns (tables)
 - deleting, 271
 - erasing, 270
 - functions, 87
 - inserting, 271
 - parametric equations, 139
 - polar equations, 160
 - sequences, 123–124
 - sorting, 271–272
 - titles, 268–269
- combinations, 261–262
- combining arithmetic expressions, 33
- comDenom command, 50
- command line
 - editing entries, 15
 - Home screen, 11
 - recalling entries, 14–15
- commands
 - and, 39
 - arcLen, 175
 - cFactor, 51, 60
 - comDenom, 50
 - cSolve, 50, 60
 - CubicReg, 284
 - d*, 172
 - deSolve, 205
 - DMS, 53
 - expand, 51–52
 - ExpReg, 284
 - factor, 51
 - fMax, 178
 - fMin, 178
 - integral, 174
 - limit, 175–176
 - LinReg, 284
 - LnReg, 284
 - Logistic, 284
 - MedMed, 284
 - norm, 186
 - PowrReg, 284
 - product, 177
 - propFrac, 51
 - QuadReg, 284
 - QuartReg, 284
 - SinReg, 284
 - solve, 45–46
 - sum, 177
 - taylor, 179
 - tCollect, 54–55
 - tExpand, 54–55
 - Value, 90–91, 125–126, 141–142
 - with, 39
 - ZoomBox, 79–80, 118, 133–134, 154–155
 - ZoomData, 78
 - ZoomDec, 78
 - ZoomFit, 78, 114, 118, 132, 154
 - ZoomIn, 79, 118, 134
 - ZoomInt, 79
 - ZoomOut, 79, 118, 134
 - ZoomSqr, 79, 133, 154
 - ZoomStd, 77–78
 - ZoomTrig, 78
- commas, 26
- common errors
 - angles, 304
 - arguments (functions), 304

- common errors (*continued*)
 - Complex Format (Mode menu), 304
 - functions, 304
 - implied multiplication, 304
 - negative numbers, 303
 - order of operations, 303–304
 - variables, 304
- common log functions
 - entering, 27
 - evaluating, 44
- Complex Format mode, 20, 304
- complex numbers
 - algebra, 59
 - arithmetic operations, 58
 - conjugate, 59
 - displaying, 57
 - entering, 58
 - equation solutions, 60
 - factors, 60
 - i , 58
 - imaginary part, 59
 - modulus (absolute value), 59
 - polar form, 57
 - real part, 59
 - rectangular form, 57
 - storing, 58
- computer
 - connecting to calculator, 290–291
 - TI Connect software, 289–291
- Computer Algebra System (CAS)
 - features, 37
- conjugate of complex numbers, 59
- connecting
 - calculator to computer, 290–291
 - calculators, 293–294
- contour levels graphing style, 191–192
- contour maps
 - converting between level curves and contour maps, 202–203
 - custom contour maps, 200–202
 - graphing a contour that passes through a specific point, 203
 - 2D contour maps, 189–195
- contrast of screen, 11
- convergence of sums/products, 177
- conversions for trigonometric functions, 56
- converting
 - angles to degrees, 54
 - angles to degrees, minutes, and seconds (DMS), 53–54
 - angles to radians, 54
 - coordinates, 147–149, 180–182
 - decimals to fractions, 28
 - higher order ODEs to first order ODEs, 238
 - level curves and contour maps, 202–203
- coordinates
 - converting, 147–149, 180–182
 - cursor coordinates, 119, 136, 156
 - cylindrical coordinates, 180–181
 - polar coordinates, 147, 180
 - rectangular coordinates, 180–181
 - spherical coordinates, 180–181
 - x-coordinates, 178
- Coordinates graph format, 191
- copying matrices, 248–249
- \cos^{-1} trigonometric function, 41
- cosecant trigonometric function, 41–43
- cosine trigonometric function, 40–41
- \cot^{-1} trigonometric function, 41–43
- cotangent trigonometric function, 41–43
- creating
 - box plots, 274–277
 - column titles, 268–269
 - contour maps, 200
 - Custom menus, 308–311
 - functions, 313–315
 - functions (user-defined), 38
 - histograms, 274–277
 - modified box plots, 274–277
 - viewing windows, 81
- cross products (vectors), 185
- \csc^{-1} trigonometric function, 41–43
- cSolve command, 50, 60
- Cubic regression model, 284
- CubicReg command, 284
- Current Folder mode, 18
- cursor coordinates
 - parametric equations, 136
 - polar graphs, 156
 - sequences, 119
- cursor movement, 11

- curve fitting, 273
 - curves
 - arc length, 175
 - slope, 96–97
 - custom contour maps, 200–202
 - Custom format (graphs), 111
 - custom level curve graphs, 200–202
 - Custom menus
 - creating, 308–311
 - Default Custom menu, 307
 - defined, 307
 - displaying, 312
 - editing, 312
 - installing, 311–312
 - menu items, 309
 - naming, 308–309
 - submenus, 309–310
 - titles, 309
 - uninstalling, 312
 - vector calculus, 187
 - Custom Units mode, 21
 - cylindrical coordinates, 180–181
 - CYLINDRICAL mode, 20
- D •**
- d* command, 172
 - data (statistical)
 - analyzing, 280–283
 - box plots, 275–277
 - column titles, 268–269
 - curve fitting, 273
 - Data/Matrix editor, 265–267
 - editing, 270–271
 - entering, 265–267
 - formulas, 267–268
 - histograms, 274–277
 - modified box plots, 274–277
 - outliers, 274
 - plotting one-variable data, 273–277
 - plotting two-variable data, 278–279
 - recalling, 269–270
 - regression models, 284–285
 - scatter plot, 278–279
 - sorting, 271–272
 - tracing statistical data plots, 279
 - xy-line plot, 278–279
 - Data type error message, 305
 - Data/Matrix editor
 - exiting, 245
 - matrices, 241–246
 - quitting, 245
 - statistical data, 265–267
 - decimal numbers
 - converting to fractions, 28
 - generating randomly, 263
 - decreasing contrast of screen display, 11
 - Default Custom menu, 307
 - defining
 - functions, 37–39
 - matrices, 241–245
 - definite integrals
 - evaluating, 174–175
 - finding, 97–98
 - variables, 174
 - deleting. *See also* clearing contents; erasing; removing
 - cells, 271
 - columns (data), 271
 - columns from a matrix, 246–247
 - entries, 15
 - matrices, 249
 - rows (data), 271
 - rows from a matrix, 246–247
 - variables, 31–33
 - denoting
 - pairs of parametric equations, 127
 - polar equations, 149
 - sequences, 107
 - vectors, 183
 - derivatives
 - evaluating, 172–174
 - finding, 172–173
 - functions, 96
 - hyperbolic functions, 182
 - parametric equations, 142–143
 - polar equations, 163–164
 - variables, 172
 - deSolve command, 205
 - determinant of a matrix, 254
 - Device Explorer program, 291
 - differential equation solutions
 - boundary value problems, 208–209
 - deSolve command, 205

- differential equation solutions (*continued*)
 - first order homogeneous linear systems, 209–224
 - first order nonhomogeneous linear systems, 209–210, 224–226
 - general solutions, 206–208
 - higher order ODEs, 228–229
 - initial value problems, 206, 208–209, 226–228
- differential equations
 - graphing, 229–237
 - higher order, 233–235, 238
 - linear systems of, 209–210
 - phase planes, 235–237
 - portraits, 235–237
- dimensions
 - matrices, 241
 - viewing window, 113–114
- Display Digits mode, 18–19
- displaying
 - complex numbers, 57
 - Custom menus, 312
 - MATH Number menu, 28
 - parametric equations in a table, 136–138
 - sequences in a table, 120–124
- distance between two points
 - function graphs, 100–101
 - parametric equations, 143–144
 - polar equations, 164–165
- divergence of sums/products, 177
- dividing
 - polynomials, 51
 - rational expressions, 51
- DMS command, 53
- dot graphing style
 - parametric equations, 128
 - sequences, 108
- dot products (vectors), 185
- downloading
 - applications, 300–301
 - TI Connect software, 289–290
 - TI-Graph Link software, 316
- **E** •
 - e transcendental number, 26
 - ebooks, 300
 - editing
 - Custom menus, 312
 - entries, 15
 - matrices, 246
 - statistical data, 270–271
 - editors
 - Data/Matrix editor, 241–246, 265–267
 - Program editor, 316
 - Table Setup editor, 121
 - Window editor, 66–67, 112–113, 130–131, 151–152
 - Y= editor, 111–112
 - eigenvalues
 - matrices, 254
 - ordinary differential equations (ODEs), 210–224
 - eigenvectors
 - matrices, 254
 - ordinary differential equations (ODEs), 210–224
 - electronic flash cards, 300
 - ENGINEERING mode, 19
 - engineering notation, 19
 - ENTER key, 12, 14
 - entering
 - angles, 40, 52–53, 304
 - arguments (functions), 304
 - arithmetic expressions, 25–26
 - columns (matrices), 242–243
 - complex numbers, 58
 - exponential functions, 26, 43–44
 - functions, 63–64
 - letters, 13
 - logarithmic functions, 26–27
 - numbers, 26
 - parametric equations, 127–128
 - polar equations, 149–150
 - power of a matrix, 253
 - rows (matrices), 242–243
 - sequences, 107–109
 - statistical data, 265–267
 - text, 13
 - vectors, 183–184
 - entries
 - deleting, 15
 - editing, 15
 - erasing characters, 14–15

- inserting characters, 15
- keying over characters, 15
- recalling, 14–15
- equation of a tangent line
 - function graphs, 101–102
 - parametric equations, 144–145
 - polar equations, 166–167
- equations (differential)
 - boundary value problems, 208–209
 - graphing, 229–237
 - higher order, 233–235, 238
 - initial value problems, 206, 208–209, 226–228
 - linear systems of, 209–210
 - phase planes, 235–237
 - portraits, 235–237
 - solving, 205–229
- equations (general)
 - finding particular solutions, 47–49
 - finding real and complex solutions, 50
 - solving, 45–46
- equations (parametric)
 - arc length, 145–146
 - cursor coordinates, 136
 - denoting pairs, 127
 - derivatives, 142–143
 - distance between two points, 143–144
 - entering, 127
 - equation of a tangent line, 144–145
 - evaluating, 140–142
 - graphing, 129–132
 - graphing styles, 128–129
 - number of, 135
 - regraphing, 132
 - table display options, 136–139
 - value of the parameter t , 135
 - viewing graphs and tables on the same screen, 139–140
 - Window editor, 130–131
- equations (polar)
 - arc length, 167–168
 - denoting, 149
 - derivatives, 163–164
 - distance between two points, 164–165
 - entering, 149–150
 - equation of a tangent line, 166–167
 - evaluating, 162–163
 - graphing, 150–153
 - number of, 156
 - table display options, 157–160
 - value of the parameter, 156
 - viewing graphs and tables on the same screen, 161
 - viewing window, 152–153
 - Window editor, 151–152
- erasing. *See also* clearing contents;
deleting; removing
 - characters, 14–15
 - contents of a data column, 270
- erroneous results, 176–177
- error messages
 - Bound, 305
 - Break, 16, 305
 - Data type, 305
 - false, 305
 - Link transmission, 305
 - matrices, 243
 - Missing, 305
 - Non-real result, 305
 - Singular matrix, 306
 - Syntax, 303, 306
 - Window variables domain, 304, 306
- errors
 - angles, 304
 - arguments (functions), 304
 - Complex Format (Mode menu), 304
 - functions, 304
 - implied multiplication, 304
 - negative numbers, 303
 - order of operations, 303–304
 - variables, 304
- ESC key, 14
- evaluating
 - arithmetic expressions, 26
 - combinations, 261–262
 - \cos^{-1} trigonometric function, 41
 - cosecant trigonometric function, 41–43
 - cosine trigonometric function, 40–41
 - \cot^{-1} trigonometric function, 41–43
 - cotangent trigonometric function, 41–43
 - \csc^{-1} trigonometric function, 41–43
 - derivatives, 172, 174

evaluating (*continued*)
 exponential function, 43
 functions (user-defined), 38–39
 hyperbolic functions, 182
 integrals, 174–175
 limits, 175–177
 logarithmic functions, 44
 parametric equations, 140–142
 partial derivatives, 173–174
 permutations, 261–262
 polar equations, 162–163
 products, 177–178
 \sec^{-1} trigonometric function, 41–43
 secant trigonometric function, 41–43
 sequences, 125–126
 \sin^{-1} trigonometric function, 41
 sine trigonometric function, 40–41
 sums, 177–178
 \tan^{-1} trigonometric function, 41
 tangent trigonometric function, 40–41
 exact answer, 89
 exact function, 28
 Exact mode, 21
 Excel (Microsoft), 299
 exiting
 applications, 10
 Data/Matrix editor, 245
 menus, 17
 expand command, 51–52
 Exponential Format mode, 19
 exponential functions
 entering, 26, 43–44
 evaluating, 43
 Exponential regression model, 284
 ExpReg command, 284
 expressions
 combining, 33
 entering, 25–26
 evaluating, 26
 matrices, 251–253
 order of operations, 29–30
 previous answers, 30
 variables, 30–31

● F ●

factor command, 51
 factoring
 polynomials, 51–52
 rational expressions, 51–52
 factors (complex numbers), 60
 false error message, 305
 Fibonacci sequence, 107
 file transfers
 Appleworks, 299
 from calculator to computer, 291
 low batteries warning, 10
 Microsoft Excel, 299
 Microsoft Word, 300
 from single calculator to multiple
 calculators, 296
 from single calculator to single calculator,
 294–295
 finding
 arc length, 145–146, 175
 definite integrals, 97–98
 derivatives, 172–173
 hyperbolic functions, 182
 inverse of a matrix, 253–254
 length of a vector, 186
 Maclaurin polynomials, 179–180
 maximum points of x -coordinates, 178
 minimum points of x -coordinates, 178
 partial derivatives, 173
 particular solutions to equations, 47–49
 products, 177
 real and complex solutions to
 equations, 50
 slope of a curve, 96–97
 sums, 177
 Taylor polynomials, 178–180
 value of a function, 90–91
 zeros of a function, 91–92
 first order ODEs
 converting higher order ODEs to first
 order ODEs, 238
 graphing, 229–233
 solving, 210–228

- flash cards, 300
- floor function, 28
- fMax command, 178
- fMin command, 178
- formulas, 267–268
- fPart function, 28
- fractions, converting to decimal numbers, 28
- Full Screen mode, 125
- function graphs
 - accuracy of, 69–71
 - arc length, 102–103
 - distance between two points, 100–101
 - equation of a tangent line, 101–102
 - inflection points, 98–100
 - maximum point, 93
 - minimum point, 93–94
 - panning, 83
 - points of intersection, 94–95
 - recalling, 75–76
 - saving, 75
 - Stat Plots, 65
 - table display options, 83–87
 - tracing, 81–83
 - viewing graph and table on the same screen, 87–88
 - viewing graph and the Y= Editor on the same screen, 74–75
 - viewing windows, 81
 - zooming operations, 77–80
- Function mode, 63
- functions
 - absolute value (abs), 28
 - arguments, 304
 - ceiling, 28
 - common errors, 304
 - common log, 27
 - creating, 313–315
 - defined, 313
 - defining, 37–39
 - definite integrals, 97–98
 - derivatives, 96
 - entering, 63–64
 - exact, 28
 - exponential, 26, 43–44
 - finding value of, 90–91
 - finding zeros of, 91–92
 - floor, 28
 - fPart, 28
 - gcd, 29
 - graphing, 65–69
 - graphing styles, 65–66
 - hyperbolic, 182
 - inverse trigonometric, 27
 - iPart, 28
 - lcm, 29
 - logarithmic, 26–27, 44
 - mod, 28
 - naming, 314
 - natural log, 26
 - number of, 81–82
 - piecewise-defined, 71–73
 - remain, 28
 - round, 28
 - sequence functions, 107
 - sign, 28
 - square root, 27
 - user-defined functions, 37–39
 - values, 90–91
 - values of x and y , 82
 - Window editor, 66–67
 - zeros, 91–92
- functions (trigonometric)
 - conversions, 56
 - \cos^{-1} , 41
 - cosecant, 41–43
 - cosine, 40–41
 - \cot^{-1} , 41–43
 - cotangent, 41–43
 - \csc^{-1} , 41–43
 - graphing, 73–74
 - inverses, 27, 41–43
 - MATH Trig menu, 27
 - \sec^{-1} , 41–43
 - secant, 41–43
 - \sin^{-1} , 41
 - sine, 40–41
 - \tan^{-1} , 41
 - tangent, 41
 - tCollect command, 54–55
 - tExpand command, 54–55

• G •

- gcd function, 29
- generating random numbers
 - decimal numbers, 263
 - integers, 262
 - seeding the random number generator, 263
- generating tables automatically
 - functions, 83–87
 - parametric equations, 136–139
 - polar equations, 157–160
 - sequence values, 120–124
- Geometer's Sketchpad application, 300
- geometry
 - Cabri Geometry II Plus software for Windows, 299
 - Cabri Jr. application, 299
 - Geometer's Sketchpad application, 300
- Graph mode, 18
- graphing
 - functions, 65–69
 - functions of two variables, 189–195
 - functions (user-defined), 39
 - implicitly defined functions, 202
 - level curve or contour that passes through a specific point, 203
 - ordinary differential equations (ODEs), 229–237
 - parametric equations, 129–132
 - piecewise-defined function, 71–73
 - polar equations, 150–153
 - sequences, 110–115
 - trigonometric functions, 73–74
- graphing styles
 - functions, 65–66
 - parametric equations, 128–129
 - sequences, 108
 - 3D graphs, 191–192, 198
- graphs (function graphs)
 - accuracy of, 69–71
 - arc length, 102–103
 - distance between two points, 100–101
 - equation of a tangent line, 101–102
 - inflection points, 98–100
 - maximum point, 93
 - minimum point, 93–94
 - panning, 83
 - points of intersection, 94–95
 - recalling, 75–76
 - saving, 75
 - Stat Plots, 65
 - table display options, 83–87
 - tracing, 81–83
 - viewing graph and table on the same screen, 87–88
 - viewing graph and the Y= Editor on the same screen, 74–75
 - viewing windows, 81
 - zooming operations, 77–80
- graphs (general)
 - Axes format, 119, 191
 - Coordinates format, 191
 - writing/text, 278
- graphs (parametric graphs)
 - cursor coordinates, 136
 - panning, 135
 - tracing, 134–136
 - zooming, 132–134
- graphs (polar graphs)
 - cursor coordinates, 156
 - panning, 157
 - tracing, 155–157
 - zooming operations, 153–155
- graphs (sequence graphs)
 - cobweb plot, 110–111
 - cursor coordinates, 119
 - Custom format, 111
 - saving, 115
 - Stat Plots, 111–112
 - Time format, 110
 - tracing, 118–120
 - viewing window, 113–114
 - Web format, 110–111
 - web plot, 110–111
 - zooming, 114, 118
- graphs (statistical data plots)
 - box plots/modified box plots, 274–277
 - histograms, 273–277
 - scatter plot, 278–279
 - tracing, 279–280
 - xy-line plot, 278–279

graphs (3D graphs)
 animating, 197
 changing styles, 198
 contour maps, 189–195, 200
 converting between level curves and
 contour maps, 202–203
 custom contour maps, 201–202
 custom level curve graphs, 200–202
 graphing styles, 191–192, 198
 level curves, 189–195
 rotating, 196
 surfaces, 189–195
 tracing, 198–199
 viewing along a coordinate axis, 197–198
 zooming operations, 195–196

• H •

help
 Device Explorer program, 291
 TI Connect software, 290
 hidden surface graphing style, 191
 higher order ODEs
 converting to first order ODEs, 238
 graphing, 233–235
 solving, 228–229
 highlighting matrices, 245
 histograms
 creating, 274–277
 defined, 273
 tracing, 279
 history area, 11
 Home screen
 clearing contents, 11, 25
 command line, 11
 features, 11
 history area, 11
 layout, 11
 matrices, 241–242
 Toolbar, 11
 hyperbolic functions, 182

• I •

i complex number, 58
 identity matrix, 252

imaginary part of complex numbers, 59
 implicit plot graphing style, 192
 implied multiplication, 32, 304
 increasing contrast of screen display, 11
 indefinite integrals
 evaluating, 174–175
 variables, 174
 inequalities
 piecewise-defined functions, 72
 solving, 45–46
 inflection points (function graphs), 98–100
 initial values (sequences), 110
 Insert mode, 15
 inserting
 cells, 270–271
 characters, 15
 columns (data), 271
 columns in a matrix, 246–247
 rows (data), 271
 rows in a matrix, 246–247
 installing
 applications, 301
 Custom menus, 311–312
 TI Connect software, 290
 TI-Graph Link software, 316
 integers, generating randomly, 262
 integral command, 174
 integrals
 evaluating, 174–175
 functions, 97–98
 hyperbolic functions, 182
 variables, 174
 inverses
 matrices, 253–254
 trigonometric functions, 27, 41–43
 iPart function, 28

• J •

juxtaposition, 32

• K •

keyboard, 300
 keying over characters, 15

keys

- ALPHA key, 13
- applications, 16
- APPS key, 16
- arrow keys (directional arrows), 11
- Backspace key, 14
- CLEAR key, 14
- common log function, 27
- ENTER key, 12, 14
- ESC key, 14
- exponential function, 26
- inverse trigonometric functions, 27
- ON key, 10
- menus, 16
- natural log function, 26
- negation key, 26
- pi (Π), 26
- 2nd key, 11–12
- secondary key function (◻ key), 12
- subtraction key, 26
- trigonometric functions, 27

• **L** •

- labels on graphs, 191
- Language mode, 21
- lcm function, 29
- length of vectors, 186
- letters
 - ALPHA key, 13
 - entering, 13
- level curve graphs
 - converting between level curves and contour maps, 202–203
 - creating, 189–195
 - custom level curve graphs, 200–202
 - graphing level curve that passes through a specific point, 203
- license agreements for applications, 301
- limit command, 175–176
- limits
 - erroneous results, 176–177
 - evaluating, 175–177
 - variables, 176

line graphing style

- parametric equations, 128
- sequences, 108
- line (thick) graphing style, 108
- Linear regression model, 284
- Link transmission error message, 305
- linking calculators, 293–294
- LinReg command, 284
- LnReg command, 284
- logarithmic functions
 - entering, 26–27
 - evaluating, 44
- Logarithmic regression model, 284
- Logistic command, 284
- Logistic regression model, 284
- low batteries warning, 10

• **M** •

Mac operating system

- TI Connect software, 289
- TI-Graph Link software, 316
- Maclaurin polynomials, 179–180
- MATH Calculus menu, 171–172
- MATH Hyperbolic menu, 28, 182
- MATH Number menu, 27–28
- MATH Trig menu, 27
- matrices
 - adding, 253
 - adding columns/rows, 246–247
 - adjusting column width, 244
 - appending, 247–248
 - arithmetic expressions, 251–253
 - augmenting, 247–248
 - calculator memory, 241, 249
 - column width, 244
 - copying, 248–249
 - Data/Matrix editor, 241–246
 - defined, 241
 - defining, 241–245
 - deleting, 249
 - deleting columns/rows, 246–247
 - determinant, 254
 - dimensions, 241
 - editing, 246

- eigenvalues, 254
- eigenvectors, 254
- entering a power, 253
- entering columns/rows, 242–243
- error messages, 243
- finding the inverse, 253–254
- highlighting, 245
- Home screen, 241–242
- identity matrix, 252
- inverse, 253–254
- multiplying, 253
- naming, 243
- negating, 252
- opening, 245
- power, 253
- recalling, 245
- redefining, 246
- reduced row-echelon form (rref), 255–257
- referencing, 242
- scalar multiple, 252
- Singular matrix error message, 306
- solving systems of equations, 255–257
- storing, 242–244
- subtracting, 253
- transposing, 253–254
- values, 244
- variables, 242
- viewing, 244
- maximum point
 - function graphs, 93
 - x -coordinates, 178
- Median-median regression model, 284
- MedMed command, 284
- memory (in calculator), 241, 249
- menus
 - accessing, 16–17
 - exiting, 17
 - keys or key combinations, 16
 - scrolling, 17
 - selecting menu items, 17
 - submenus, 17
- menus (Custom menus)
 - creating, 308–311
 - Default Custom menu, 307
 - defined, 307
 - displaying, 312
 - editing, 312
 - installing, 311–312
 - menu items, 309
 - naming, 308–309
 - submenus, 309–310
 - titles, 309
 - uninstalling, 312
 - vector calculus, 187
- messages
 - Bound, 305
 - Break, 16, 305
 - Data type, 305
 - false, 305
 - Link transmission, 305
 - matrices, 243
 - Missing, 305
 - Non-real result, 305
 - Singular matrix, 306
 - Syntax, 303, 306
 - Window variables domain, 304, 306
- Microsoft Excel, 299
- Microsoft Word, 300
- minimum point
 - function graphs, 93–94
 - x -coordinates, 178
- mini-programs, 33
- Missing error message, 305
- mod function, 28
- Mode menu
 - options, 18–21
 - screens, 17–18
- modes
 - Angle, 19
 - Approximate, 21
 - Apps Desktop, 21
 - Base, 21
 - Complex Format, 20, 304
 - Current Folder, 18
 - Custom Units, 21
 - Display Digits, 18–19
 - Exact, 21
 - Exponential Format, 19
 - Full Screen, 125
 - Function, 63

modes (*continued*)

- Graph, 18
- Insert, 15
- Language, 21
- POLAR, 20, 149
- Pretty Print, 20
- saving mode settings, 18–21
- SEQUENCE, 107
- setting, 17–18
- Split Screen, 20–21, 124–125
- Type Over, 15
- Unit System, 21
- Vector Format, 20
- modified box plots
 - creating, 274–277
 - defined, 274
 - tracing, 280
 - whiskers, 274
- modulus (absolute value) of complex numbers, 59
- money in sequences, 107
- moving the cursor, 11
- moving files
 - Appleworks, 299
 - from calculator to computer, 291
 - low batteries warning, 10
 - Microsoft Excel, 299
 - Microsoft Word, 300
 - from single calculator to multiple calculators, 296
 - from single calculator to single calculator, 294–295
- multiplication
 - implied multiplication, 32, 304
 - matrices, 253
- multiplying
 - polynomials, 51
 - rational expressions, 51

• *N* •

naming

- Custom menus, 308–309
- functions, 314
- functions (user-defined), 38

- matrices, 243
- vectors, 184
- natural log functions
 - entering, 26
 - evaluating, 44
- negating matrices, 252
- negation key, 26
- negative numbers, 303
- nmax setting (Window editor), 113
- nmin setting (Window editor), 112–113
- Non-real result error message, 305
- norm command, 186
- NORMAL mode, 19
- normal notation, 19
- notation options
 - engineering notation, 19
 - normal notation, 19
 - scientific notation, 19
- Notefolio application, 300
- Notefolio Creator software, 300
- number of
 - functions, 81–82
 - parametric equations, 135
 - polar equations, 156
 - sequences, 118, 120
- numbers, entering, 26

• *O* •

- ODEs (ordinary differential equations)
 - graphing, 229–237
 - higher order, 233–235, 238
 - linear systems of, 209–210
 - phase planes, 235–237
 - portraits, 235–237
- ODEs (ordinary differential equations) solutions
 - boundary value problems, 208–209
 - deSolve command, 205
 - first order homogeneous linear systems, 209–224
 - first order nonhomogeneous linear systems, 209–210, 224–226
 - general solutions, 206–208
 - higher order ODEs, 228–229
 - initial value problems, 206, 208–209, 226–228

- ON key, 10
- one-sided limits
 - erroneous results, 176–177
 - evaluating, 175–177
 - variables, 176
- opening matrices, 245
- operating system
 - out-of-date, 41, 56
 - upgrading, 291
- operations
 - complex numbers, 58
 - order of, 29–30, 303–304
 - vector operations, 185–187
- ordinary differential equations (ODEs). *See* ODEs (ordinary differential equations)
- Organizer application, 300
- outliers (statistical data), 274
- out-of-date operating system, 41, 56
- p •**
- panning
 - function graphs, 83
 - parametric graphs, 135
 - polar graphs, 157
- parametric equations
 - arc length, 145–146
 - cursor coordinates, 136
 - denoting pairs, 127
 - derivatives, 142–143
 - distance between two points, 143–144
 - entering, 127
 - equation of a tangent line, 144–145
 - evaluating, 140–142
 - graphing, 129–132
 - graphing styles, 128–129
 - number of, 135
 - regraphing, 132
 - table display options, 136–139
 - value of the parameter t , 135
 - viewing graphs and tables on the same screen, 139–140
 - Window editor, 130–131
- parametric graphs
 - cursor coordinates, 136
 - panning, 135
 - tracing, 134–136
 - zooming, 132–134
- partial derivatives
 - evaluating, 173–174
 - finding, 173
- partial fraction decompositions of rational expressions, 52
- path graphing style for parametric equations, 128
- permutations, 261–262
- personal organizer, 300
- phase planes of differential equations, 235–237
- pi (Π), 26
- piecewise-defined functions
 - graphing, 71–73
 - inequalities, 72
- plotStep setting (Window editor), 113
- plotStrt setting (Window editor), 113
- plotting
 - one-variable data, 273–277
 - two-variable data, 278–279
- points of intersection (function graphs), 94–95
- polar coordinates
 - converting between rectangular and polar coordinates, 147–149, 180
 - defined, 147
 - denoting, 147
- polar equations
 - arc length, 167–168
 - denoting, 149
 - derivatives, 163–164
 - distance between two points, 164–165
 - entering, 149–150
 - equation of a tangent line, 166–167
 - evaluating, 162–163
 - graphing, 150–153
 - number of, 156
 - table display options, 157–160
 - value of the parameter, 156
 - viewing graphs and tables on the same screen, 161
 - viewing window, 152–153
 - Window editor, 151–152
- polar form for complex numbers, 57

- polar graphs
 - cursor coordinates, 156
 - panning, 157
 - tracing, 155–157
 - zooming operations, 153–155
- POLAR mode, 20, 149
- polynomials
 - adding, 50
 - dividing, 51
 - factoring, 51–52
 - Maclaurin polynomials, 179–180
 - multiplying, 51
 - partial fraction decompositions, 52
 - subtracting, 50
 - Taylor polynomials, 178–180
- portraits of differential equations, 235–237
- power of a matrix, 253
- Power regression model, 284
- PowrReg command, 284
- Pretty Print mode, 20
- previous answers in arithmetic
 - expressions, 30
- probability
 - combinations, 261–262
 - permutations, 261–262
 - random numbers, 262–263
- processes, aborting, 16
- product command, 177
- products
 - convergence, 177
 - cross products (vectors), 185
 - divergence, 177
 - dot products (vectors), 185
 - evaluating, 177–178
 - finding, 177
- Program editor, 316
- programs
 - defined, 313
 - mini-programs, 33
 - TI-Graph Link software, 316
- propFrac command, 51

• Q •

- Quadratic regression model, 284
- QuadReg command, 284

- Quartic regression model, 284
- QuartReg command, 284
- quitting
 - applications, 10
 - Data/Matrix editor, 245
 - menus, 17

• R •

- random numbers
 - decimal numbers, 263
 - generating, 262–263
 - integers, 262
- rational expressions
 - adding, 50
 - dividing, 51
 - factoring, 51–52
 - multiplying, 51
 - partial fraction decompositions, 52
- REAL mode, 20
- real part of complex numbers, 59
- recalling
 - entries, 14–15
 - function graphs, 75–76
 - matrices, 245
 - statistical data, 269–270
 - vectors, 185
- rectangular coordinates
 - converting between rectangular and polar coordinates, 147–149, 180
 - converting between rectangular, cylindrical, and spherical coordinates, 180–181
- rectangular form for complex numbers, 57
- RECTANGULAR mode
 - complex format, 20
 - vector format, 20
- redefining matrices, 246
- reduced row-echelon form (rref), 255–257
- referencing matrices, 242
- registering TI Connect software, 290
- regraphing
 - parametric equations, 132
 - sequences, 115
- regression models, 284–285
- remain function, 28

removing. *See also* clearing contents;
 deleting; erasing
 columns from a matrix, 246–247
 rows from a matrix, 246–247

rotating 3D graphs, 196

round function, 28

rows (matrices)
 adding, 246–247
 deleting, 246–247
 dimensions, 241
 entering, 242–243

rows (tables)
 data, 271
 functions, 87
 parametric equations, 139
 polar equations, 160
 sequences, 123–124

ref (reduced row-echelon form), 255–257

running TI Connect software, 290

● **S** ●

saving
 function graphs, 75
 functions (user-defined), 38
 graphs, 115
 mode settings, 18–21
 viewing windows, 81

scalar multiple of a matrix, 252

scatter plots, 278–280

SCIENTIFIC mode, 19

scientific notation, 19

screen
 BUSY indicator, 15
 contrast, 11
 Full Screen mode, 125
 scrolling past top of screen, 15
 Split Screen mode, 20–21, 124–125

scrolling
 menus, 17
 past top of screen, 15

\sec^{-1} trigonometric function, 41–43

secant trigonometric function, 41–43

secondary key function (◀ key), 12

seeding the random number generator, 263

selecting
 graphing styles, 108, 128
 menu items, 17

sequence functions, 107

sequence graphs
 cobweb plot, 110–111
 cursor coordinates, 119
 Custom format, 111
 saving, 115
 Stat Plots, 111–112
 Time format, 110
 tracing, 118–120
 viewing window, 113–114
 Web format, 110–111
 web plot, 110–111
 zooming, 114, 118

SEQUENCE mode, 107

sequences
 Axes format, 119
 cursor coordinates, 119
 defined, 107
 denoting, 107
 entering, 107–109
 evaluating, 125–126
 Fibonacci, 107
 graphing, 110–115
 graphing styles, 108
 initial values, 110
 money, 107
 number of, 118, 120
 regraphing, 115
 table display options, 120–124
 value of the independent variable n ,
 118–120
 viewing graphs and tables on the same
 screen, 124–125
 Window editor, 112–113

setting
 clock, 22–23
 modes, 17–21
 viewing window, 193

sign function, 28

\sin^{-1} trigonometric function, 41

sine trigonometric function, 40–41

Singular matrix error message, 306

- SinReg command, 284
- Sinusoidal regression model, 284
- slope of a curve, finding, 96–97
- software (TI Connect)
 - current version, 289
 - Device Explorer program, 291
 - downloading, 289–290
 - help, 290
 - installing, 290
 - installing applications, 301
 - Mac, 289
 - registering, 290
 - running, 290
 - subprograms, 290
 - updating, 291
 - Windows, 289
- solve command, 45–46
- solving
 - equations, 45–46
 - higher order ODEs, 228–229
 - inequalities, 45–46
 - system of trigonometric equations, 49
 - systems of equations, 45–49
 - systems of equations with matrices, 255–257
 - trigonometric equations, 49
- solving differential equations
 - boundary value problems, 208–209
 - deSolve command, 205
 - first order homogeneous linear systems, 209–224
 - first order nonhomogeneous linear systems, 209–210, 224–226
 - general solutions, 206–208
 - higher order ODEs, 228–229
 - initial value problems, 206, 208–209, 226–228
- sorting statistical data, 271–272
- spherical coordinates, 180–181
- SPHERICAL mode, 20
- Split Screen mode, 20–21, 124–125
- spreadsheets
 - Appleworks, 299
 - CellSheet application, 299
 - Microsoft Excel, 299
 - TI CellSheet Converter software, 299
- square brackets ([]) in vectors, 183
- square graphing style
 - parametric equations, 128
 - sequences, 108
- square-root function, 27
- Standard viewing window, 192
- Stat Plots
 - function graphs, 65
 - polar equations, 150–151
 - turning on/off, 111–112
- statistical data
 - analyzing, 280–283
 - box plots, 274–277
 - column titles, 268–269
 - curve fitting, 273
 - Data/Matrix editor, 265–267
 - editing, 270–271
 - entering, 265–267
 - formulas, 267–268
 - histograms, 273–277
 - modified box plots, 274–277
 - outliers, 274
 - plotting one-variable data, 273–277
 - plotting two-variable data, 278–279
 - recalling, 269–270
 - regression models, 284–285
 - scatter plot, 279
 - sorting, 271–272
 - tracing statistical data plots, 279–280
 - xy-line plot, 278–279
- statistical variables, 283
- Statistics with List Editor application, 300
- storing
 - complex numbers, 58
 - matrices, 242–244
 - variables, 30–31
 - vectors, 184
- StudyCards application, 300
- submenus, 17
- subprograms (TI Connect software), 290
- subtracting
 - matrices, 253
 - polynomials, 50
 - rational expressions, 50
- subtraction key, 26
- sum command, 177

- sums
 - convergence, 177
 - divergence, 177
 - evaluating, 177–178
 - finding, 177
 - Symbolic Math Guide application, 300
 - Syntax error message, 303, 306
 - systems of equations. *See also* matrices
 - finding particular solutions, 47–49
 - finding real and complex solutions, 50
 - solving, 45–49
 - trigonometric equations, 49
- T ●
- table columns
 - deleting, 271
 - erasing, 270
 - functions, 87
 - inserting, 271
 - parametric equations, 139
 - polar equations, 160
 - sequences, 123–124
 - sorting, 271–272
 - titles, 268–269
 - table rows
 - data, 271
 - function graphs, 87
 - parametric equations, 139
 - polar equations, 160
 - sequences, 123–124
 - Table Setup editor, 121
 - tables
 - functions, 83–87
 - parametric equations, 136–139
 - polar equations, 157–160
 - sequence values, 120–124
 - undef*, 122
 - user-defined tables, 86, 122–123, 138–139, 159–160
 - \tan^{-1} trigonometric function, 41
 - tangent trigonometric function, 40–41
 - taylor command, 179
 - Taylor polynomials, 178–180
 - tCollect command, 54–55
 - Texas Instruments Web site, 289–290
 - tExpand command, 54–55
 - text
 - ALPHA key, 13
 - entering, 13
 - thick graphing style
 - parametric equations, 128
 - sequences, 108
 - three-dimensional (3D) graphs
 - animating, 197
 - changing styles, 198
 - contour maps, 189–195, 200
 - converting between level curves and contour maps, 202–203
 - custom contour maps, 201–202
 - custom level curve graphs, 200–202
 - graphing styles, 191–192, 198
 - level curves, 189–195
 - rotating, 196
 - surfaces, 189–195
 - tracing, 198–199
 - viewing along a coordinate axis, 197–198
 - zooming operations, 195–196
 - TI CellSheet Converter software, 299
 - TI Connect software
 - current version, 289
 - Device Explorer program, 291
 - downloading, 289–290
 - help, 290
 - installing, 290
 - installing applications, 301
 - Mac, 289
 - registering, 290
 - running, 290
 - subprograms, 290
 - updating, 291
 - Windows, 289
 - TI Keyboard, 300
 - TI Resource CD, 289
 - TI-89 calculator, 2
 - TI-89 Titanium calculator, 2
 - TI-92 Plus calculator, 2
 - TI-Graph Link cable, 290–291, 301
 - TI-Graph Link software, 316
 - time display, 22–23
 - Time format (graphs), 110
 - TI-Reader application, 300

TI-Reader Converter application, 300

titles

- columns (data), 268–269
- Custom menus, 309

Toolbar, 11

tracing

- function graphs, 81–83
- parametric graphs, 134–136
- polar graphs, 155–157
- sequence graphs, 118–120
- statistical data plots, 279–280
- 3D graphs, 198–199

transcendental number, 26

transferring files

- Appleworks, 299
- from calculator to computer, 291
- low batteries warning, 10
- Microsoft Excel, 299
- Microsoft Word, 300
- from single calculator to multiple calculators, 296
- from single calculator to single calculator, 294–295

transposing matrices, 253–254

trigonometric equations, 49

trigonometric functions

- conversions, 56
- \cos^{-1} , 41
- cosecant, 41–43
- cosine, 40–41
- \cot^{-1} , 41–43
- cotangent, 41–43
- \csc^{-1} , 41–43
- graphing, 73–74
- inverses, 27, 41–43
- MATH Trig menu, 27
- \sec^{-1} , 41–43
- secant, 41–43
- \sin^{-1} , 41
- sine, 40–41
- \tan^{-1} , 41
- tangent, 41
- tCollect command, 54–55
- tExpand command, 54–55

- turning on/off
 - calculator, 10–11
 - Pretty Print, 20
 - Stat Plots, 111–112
- two-dimensional (2D) contour maps, 189–195
- two-sided limits
 - erroneous results, 176–177
 - evaluating, 175–177
 - variables, 176
- Type Over mode, 15

• U •

- undef* (in tables), 122
- undoing zoom operations, 81
- uninstalling Custom menus, 312
- Unit System mode, 21
- unit vectors, 185
- units of measurement for angles, 52–53
- unit-to-unit Calculator Link cable, 293–294
- updating TI Connect software, 291
- upgrading the operating system, 291
- USB-to-USB cable, 290–291
- user-defined functions, 37–39
- user-defined tables
 - functions graphs, 86
 - parametric equations, 138–139
 - polar equations, 159–160
 - sequence values, 122

• V •

- Value command
 - functions, 90–91
 - parametric equations, 141–142
 - sequences, 125–126
- values
 - functions, 90–91
 - matrices, 244
- variables
 - arithmetic expressions, 30–31
 - clearing contents, 304
 - common errors, 304

- deleting, 31–33
 - derivatives, 172
 - integrals, 174
 - limits, 176
 - matrices, 242
 - statistical variables, 283
 - storing, 30–31
 - vectors, 184
 - Vector Format mode, 20
 - vector operations, 185–187
 - vectors
 - angle brackets ($\langle \rangle$), 183
 - cross products, 185
 - dot products, 185
 - entering, 183–184
 - finding length of a vector, 186
 - length, 186
 - naming, 184
 - recalling, 185
 - square brackets ($[]$), 183
 - storing, 184
 - unit vectors, 185
 - variables, 184
 - versions of TI Connect software, 289
 - viewing
 - installed applications, 299
 - matrices, 244
 - viewing graphs
 - function graph and table on the same screen, 87–88
 - function graph and the Y= Editor on the same screen, 74–75
 - parametric graphs and tables on the same screen, 139–140
 - polar graphs and tables on the same screen, 161
 - sequence graphs and tables on the same screen, 124–125
 - 3D graphs along a coordinate axis, 197–198
 - viewing windows
 - creating, 81
 - dimensions, 113–114
 - function graphs, 81
 - graphs, 192
 - polar equations, 152–153
 - saving, 81
 - setting, 193
 - Standard viewing window, 192
 - Voyage 200 calculator, 2
- *W* ●
- warning message about low battery power, 9–10
 - Web format (graphs), 110–111
 - web plots, 110–111
 - Web site address for Texas Instruments, 289–290
 - whiskers (box plots), 274
 - width of columns in matrices, 244
 - Window editor
 - functions, 66–67
 - parametric equations, 130–131
 - polar equations, 151–152
 - sequences, 112–113
 - Window variables domain error message, 304, 306
 - Windows operating system
 - TI Connect software, 289
 - TI-Graph Link software, 316
 - wire and contour graphing style, 191
 - wire frame graphing style, 191
 - with command, 39
 - Word (Microsoft), 300
 - word processing, 300
 - writing mini-programs, 33
 - writing on graphs, 278
- *X* ●
- x -coordinates, 178
 - xy -line plots, 278–280
- *Y* ●
- Y= editor, 111–112

• Z •

zeros of a function, 91–92

Zoom menu, 117, 132

ZoomBox command

function graphs, 79–80

parametric graphs, 133–134

polar graphs, 154–155

sequence graphs, 118

ZoomData command, 78

ZoomDec command, 78

ZoomFit command

function graphs, 78

parametric graphs, 132

polar graphs, 154

sequence graphs, 114, 118

ZoomIn command

function graphs, 79

parametric graphs, 134

sequence graphs, 118

zooming operations

function graphs, 77–80

parametric graphs, 132–134

polar equation graphs, 153–155

sequence graphs, 114, 118

3D graphs, 195–196

ZoomInt command, 79

ZoomOut command

function graphs, 79

parametric graphs, 134

sequence graphs, 118

ZoomSqr command

function graphs, 79

parametric graphs, 133

polar graphs, 154

ZoomStd command, 77–78

ZoomTrig command, 78