

INDEX

Symbols

#DIV/0 error, troubleshooting, 170
#DIV/0! errors, troubleshooting, 114
#N/A errors, troubleshooting, 115
#NAME? errors, troubleshooting, 115-117
#NULL! errors, troubleshooting, 117
#NUM! errors, troubleshooting, 117
#REF! errors, troubleshooting, 117-118
#VALUE! errors, troubleshooting, 118
& (ampersand) operator, 59
() (parentheses), controlling order of precedence, 61-62
3D ranges, creating, 9-10

A

absolute reference format, 66
accounting formats, 76
accounts receivable aging worksheet, building, 182-184
adding
 color scales, 31-33
 Constraints to Solver, 432-434
 controls to worksheets, 106
 data bars, 28-31
 fields to tables, 300
 formulas to data table, 364-365
 icon sets, 33-34
 records to tables, 300
 scenarios to worksheets, 376-378
 time values, 237
ADDRESS() function, 182

adjusting range name coordinates, 50-51

advanced lookup functions

INDEX() function, 206-209
 lists boxes, performing lookups on, 208
 multiple column lookups, creating, 210-211
 row-and-column lookups, creating, 209-210
MATCH() function, 206-209
 multiple column lookups, creating, 210-211
 row-and-column lookups, creating, 209-210

advertising trend, analyzing, 394

age of person, calculating, 229-231

algebraic equations, solving with Goal Seek, 373-374

amortization schedules

 dynamic, creating, 458-459
 fixed-rate, creating, 457
 variable-rate, creating, 464-465

Analysis ToolPak

 statistical tools, 280-283
 correlation coefficient, calculating, 285-287
 Descriptive Statistics tool, 283-284
 Histogram tool, 287-288
 loading, 140-141
 Random Number Generation tool, 289-291
 Rank and Percentile tool, 292-294
 XNPV() function, 493

analyzing

 advertising trend, 394
 cash flow, 488-489
 publishing a book, 499-502
 sales trend, 394

AND() function

- conditions, applying across a range, 177
- multiple logical tests, performing, 172
- values, slotting into categories, 173

anova (analysis of variance), 281**ANSI character set, 145**

- code, generating, 148

Answer report (Solver), displaying, 442-443**applying**

- conditional formatting with formulas, 175-176
- conditions
 - across a range, 177
 - to cells within ranges, 177-178
- data-validation rules to cells, 102-105
- range names to formulas, 69
 - Ignore Relative/Absolute option, 70
 - Use Row and Column Name check box, 70-71

approximations of iterative calculations, 371-372**arguments, 135-136****arithmetic formulas, 57-58****array formulas, 90**

- braces ({}), 91
- conditions, applying, 177-178
- logical functions, combining, 177-182
- operating on multiple ranges, 91-92

arrays, 89

- constants, 93
- function-utilizing, 94
- selecting, 91

articles, excluding during field sorts, 305**attributes, copying, 20-22****auditing worksheets, 126****AutoComplete feature, 47****AutoFill feature, 16-17****automatic calculation mode, selecting, 63****automatic recalculation, disabling, 62****average deviation, 272****average difference, 272****AVERAGE() function, 267****AVERAGEIF() function, 322****AVERAGEIFS() function, 324****averages, calculating, 267****B****balloon loans, calculating, 452-453****best-fit trendline**

- calculating
 - with LINEST() function, 391-393
 - with TREND() function, 390-391
- plotting on linear data, 386-399
- plotting on nonlinear data, 409
 - exponential trend, 409-414
 - logarithmic trend, 415
 - logarithmic trend, calculating, 416-417
 - power trend, 417-420

billable time, rounding, 253**birthdays, determining, 224****bottommost values, performing calculations on, 271****braces ({}), 91****break-even analysis, performing with Goal Seek, 372-373****building**

- accounts receivable aging worksheet, case study, 182-184
- employee time sheet, case study, 238, 240
- investment schedule, case study, 479-481
- loan amortization schedules
 - dynamic, 458-459
 - fixed-rate, 457
- PivotTables, 335
 - from external database, 338-339
 - from ranges, 335-338
 - from tables, 335-338
- text-based charts, 154-155

business forecasting for seasonal sales model, case study, 400-408. See also regression analysis

- with LINEST() function, 399
- with regression equation, 398
- with TREND() function, 398

buttons, Filter, 49**C****calculated field feature, 350**

- inserting in PivotTables, 352-353

calculated item feature, 351

- budgeting with, case study, 355
- inserting in PivotTables, 353-354

calculating

averages, 267
 best-fit values
 with LINEST(), 391-393
 with TREND(), 390-391
 correlation coefficient, 285-287
 cumulative totals, 254-255
 deseasoned monthly values, 406
 deseasoned trend, 407
 difference between two dates, 229
 DATEDIF() function, 229-231
 DAYS360() function, 232
 difference between two times, 237-238
 discounted payback period, 496
 exact undiscounted payback period, 495
 exponential trend, 411
 with GROWTH() function, 412-414
 fiscal quarter of a date, 249
 floating holiday dates, 227-228
 forecast trend, case study, 403
 future value, 472-473, 484
 of lump sum, 473-474
 of series of deposits, 473-474
 with varying interest rates, 478
 interest rate for future value goal, 474-475
 internal rate of return, 496-498
 Julian dates, 229
 loan payments, 451-452
 balloon loans, 452-453
 cumulative principal and interest, 455-456
 interest costs, 453-455
 interest rate, 461-462
 maximum principle, 462-463
 principal and interest, 453-454
 term of loan, 459-461
 logarithmic trend, 416-417
 median value, 267
 mode, 268
 multiple internal rates of return, 498-499
 net present value, 489-490
 with nonperiodic cash flows, 492-493
 with NPV() function, 490-491
 with varying cash flows, 491-492
 normal distribution, 276, 278
 normal trend, case study, 402
 number of workdays between two dates, 231
 person's age, 229, 231
 polynomial trend values, 422-423
 power trend values, 419-420
 present value, 484-486
 range, 272

required initial deposit for future value goal, 477-478
 required number of periods for future value goal, 475
 required regular deposit for future value goal, 476-477
 reseasoned trend, 407
 seasonal forecast, 408
 seasonal index, case study, 405-406
 seasonal trend, case study, 404
 standard deviation, 273-274
 tiered payments, 172
 undiscounted payback period, 494
 variance, 272-273
 weighted mean, 268-269

calculation mode, selecting, 63**calculations, performing in Solver, 430-431****case studies**

account numbers, generating, 158-161, 165
 accounts receivable aging worksheet, building, 182-184
 budgeting with calculated items, 355
 employee time sheet, building, 238, 240
 investment schedule, building, 479-481
 mortgages, building variable-rate amortization schedule, 464-465
 Solver, solving transportation problem, 439-441
 statistical table functions, applying to defects database, 329
 trend analysis and forecasting for seasonal sales model, 400-408

cash flow analysis, 488-489

publishing a book, 499-502

CEILING() function, 249**CELL() function, 161, 186-187****cells**

attributes, copying, 20-22
 changing, 428
 column number, returning, 161
 constraint cells, 428
 data-validation rules, applying, 102-105
 dependents, 13
 tracing, 127
 errors, tracing, 127
 multiple logical tests, performing, 171-174
 overlapping, intersection operator, 52-53
 padding, 154
 precedents, 13
 tracing, 127

- range names, 37
- selecting
 - keyboard range-selection tricks, 9
 - mouse range-selection tricks, 8
 - shortcut keys, 14
 - with Go To command, 10
 - with Go To Special dialog box, 11-15
- tracers, 126
- zeros, hiding, 82
- changing**
 - link sources, 75
 - numeric formats, 77
 - range names, 51
 - rules, 28
- changing cells, 428**
- CHAR() function, 145**
 - series of letters, generating, 147-148
- characters**
 - ANSI codes, 145
 - nonprintable, removing from strings, 153
 - removing from a string, 163-164
 - repeating, 153
- charts, text-based, building, 154-155**
- check boxes, 108**
- CHOOSE() function, 196-197**
 - day of week, determining, 198
 - integrating with worksheet option buttons, 200
 - month of fiscal year, determining, 198-199
 - weighted questionnaire responses, calculating, 199
- circular reference formulas, 95-96**
 - troubleshooting, 120-121
- CLEAN() function, 153, 164**
- clearing ranges, 23**
- CODE() function, 148**
- coefficient of determination, 389**
- color scales, adding, 31-33**
- COLUMN function, 161**
- columns**
 - fields, 334
 - transposing with rows, 23
- combining**
 - exact-match lookups with in-cell drop-down lists, 205-206
 - logical functions with arrays, 177-182
 - ranges arithmetically, 22
- combo boxes, 109-110**
- comparing**
 - buying versus leasing, 487-488
 - investing versus purchasing rental property, 486-487
 - nominal and effective interest, 470-471
- comparison formulas, 58**
- complex criteria. *See also* computed criteria tables, filtering, 310-313**
- compound criteria, 310**
- compound interest, 470**
- computed criteria, filtering tables, 313-314**
- concatenating text strings, 59**
- condition values, 83**
- conditional formatting**
 - applying with formulas, 175-176
 - color scales, adding, 31-33
 - data bars
 - adding, 28
 - customizing, 30-31
 - highlight cells rules, creating, 24-26
 - icon sets, adding, 33-34
 - top/bottom rules, creating, 26-28
- conditions**
 - applying across a range, 177
 - applying to cells within ranges, 177-178
- consolidating multisheet data**
 - by category, 101-102
 - by position, 97-100
- constants, 93**
 - naming, 44-45
- constraint cells, 428**
- constraints, 428**
 - adding to Solver, 432-434
- controlling**
 - order of precedence, 60-62
 - Solver, 435-436
- controls. *See* worksheet controls**
- convergence, 95**
- converting**
 - between nominal and effective interest, 471-472
 - dates, YYYYMMDD format, 157
 - formulas to values, 67-68
 - ranges to table, 299-300
 - text

- to lower case, 149
- to proper case, 149
- to sentence case, 156
- to upper case, 149

coordinates of range names, adjusting, 50-51

copying

- filtered data, 315
- formulas, 20-22, 64
 - absolute reference format, 66
 - relative reference format, 65

correlation coefficient, calculating, 285-287

COUNT() function, 266

COUNTIF() function, 321

COUNTIFS() function, 323

counting

- blanks in ranges, 191
- errors in ranges, 192
- occurrences of values within ranges, 180

creating

- 3D ranges, 9-10
- calculated fields in PivotTables, 352-353
- data tables, 365
- highlight cells rules, 24-26
- loan amortization schedule
 - dynamic, 458-459
 - fixed-rate, 457
- PivotTables, 335-338
- range names, 41, 44
- series, AutoFill feature, 16-17
- top/bottom rules, 26-28

CUMIPMT() function, 455

CUMPRINC() function, 455

cumulative principal and interest, calculating, 455-456

cumulative totals, calculating, 254-255

currency formats, 76

- applying to numeric values, 150

current date, returning, 218

current time, returning, 234

custom formats, deleting, 86

customer discount rate, returning with range lookup, 202-203

customizing

- data bars, 30-31
- date and time formats, 85-86
- numeric formats, 79-82

PivotTables, 339-340

- calculations, 350
- subtotal calculation, 341

D

data-validation rules, applying to cells, 102-105

data analysis tools, PivotTables.

See **PivotTables**

data areas, 335

data bars

- adding, 28
- customizing, 30-31

data fields, 332, 335

- changing summary calculation in PivotTables, 341
- difference calculations (PivotTables), 342-343
- index summary calculations (PivotTables), 348-350
- percentage summary calculations (PivotTables), 344
- running total summary calculations (PivotTables), 347

data sources, 334

data tables

- editing, 367
- formulas, adding, 364-365
- setting up, 362-367

DATE() function, 157, 218

date-related functions, 216-217

- EDATE(), 223
- EOMONTH(), 223-224
- YEARFRAC(), 232-233

date and time

- birthdays, determining, 224
- current date, returning, 218
- day, returning, 220
- difference between two dates, calculating, 229-232
- display formats, 83-86
- entering, 214-215
- floating holiday dates, calculating, 227-228
- formatting, 152, 215
- Julian dates, calculating, 229
- month, returning, 219
- two-digit years, 215-216
- upcoming dates, returning, 221-223

- weekdays
 - n*th occurrence in month, returning, 224-227
 - returning, 220-221
 - workdays between two dates, calculating, 231
 - year, returning, 219
 - YYYYMMDD format, converting, 157
 - date filters, 308**
 - date serial numbers, 213**
 - DATEDIF() function, 230-231**
 - DATEVALUE() function, 219**
 - DAVERAGE() function, 327**
 - day of week, determining with CHOOSE() function, 198**
 - DAY() function, 220**
 - DAYS360() function, 232**
 - defining range names, 38-41**
 - deleting**
 - custom formats, 86
 - fields, 301
 - range names, 52
 - records, 301
 - scenarios, 382
 - dependent variables, 385**
 - dependent workbooks, 73**
 - dependents, 13, 126**
 - tracing, 127
 - deposits, calculating future value, 473-474**
 - descriptive statistics, 265**
 - Descriptive Statistics tool (Analysis ToolPak), 283-284**
 - deseasoned monthly values, calculating, 406**
 - deseasoned trend, calculating, 407**
 - DGET() function, 327**
 - dialog boxes**
 - Go To Special, 11-15
 - New Name, 40
 - constants, naming, 44-45
 - range names, defining, 40-41
 - difference between two times, calculating, 237-238**
 - difference calculations, performing on PivotTable data fields, 342-343**
 - direct precedents, 13**
 - disabling automatic recalculation, 62**
 - discount factor, 484**
 - discount formulas**
 - buying versus leasing, 487-488
 - cash flows, analyzing, 488-489
 - future value, calculating, 484
 - hurdle rate, 490
 - investing versus purchasing rental property, 486-487
 - net present value, calculating, 489-493
 - present value, calculating, 484
 - discount rate, returning with range lookup, 202-203**
 - discounted payback period, calculating, 496**
 - displaying**
 - filtered records, 310
 - formulas, 67
 - Name Manager feature, 48
 - regression equation, 389
 - scenarios, 378-379
 - Solver reports
 - Answer report, 442-443
 - Sensitivity report, 443-445
 - table totals, 301
 - distribution types (Random Number Generation Tool)289**
 - DOLLAR() function, 150**
 - dot follower effect, 154**
 - drop-down lists, combining with exact-match lookups, 205-206**
 - DSUM() function, 332**
 - dynamic loan amortization schedule, creating, 458-459**
- ## E
-
- Easter dates, calculating, 250**
 - EDATE() function, 223**
 - Edit mode, 57**
 - editing**
 - data tables, 367
 - formulas, 56-57
 - range names, 49
 - scenarios, 379
 - effective interest, 470-472**
 - employee time sheet, building, 238-240**

enabling
 multithreaded calculation, 63
 Watch Window, 129

Enter mode, 57

entering
 date and time, 214-215
 formulas, 56

EOMONTH() function, 224

erroneous formula results, troubleshooting, 119-120

error indicator, 122

errors, 126
 #DIV/0! error, troubleshooting, 114
 #N/A error, troubleshooting, 115
 #NAME? error, troubleshooting, 115-117
 #NULL! error, troubleshooting, 117
 #NUM! error, troubleshooting, 117
 #REF! error, troubleshooting, 117-118
 #VALUE! error, troubleshooting, 118
 counting, 192
 handling with IFERROR() function, 121-122
 on ranges, ignoring, 192
 tracers, removing, 128
 tracing, 127
 troubleshooting with formula error checker, 122-126

Evaluate Formula feature, 128

EVEN() function, 250

exact undiscounted payback period, calculating, 495

exact-match lookups
 combining with in-cell drop-down lists, 205-206
 performing, 204

excluding articles during field sort, 305

exponential trend, 409-410
 calculating, 411
 with GROWTH() function, 412-414

exponential trendline, plotting, 410

extending linear trends
 with fill handle, 396
 with Series command, 396-397

external databases, building PivotTables 338-339

external references, syntax, 73-74

extracting substrings, 155

MID() function, 156
 RIGHT() function, 156
 LEFT() function, 156

F

FALSE results from IF() function, handling, 170-171

field names, 297

field values, 297

fields, 297, 334
 adding to table, 300
 deleting, 301
 selecting, 300
 sorting
 excluding articles, 305
 on part of, 304-305

fill handle, 16-17

Filter button, 49

filter criteria, 308
 compound criteria, 310
 wildcard characters, 309-310

filter lists, 306-308

filtered data, copying, 315

filtering
 defined names, 49
 tables
 quick filters, 308
 wildcard characters, 309-310
 with complex criteria, 310-313
 with computed criteria, 313-314

FIND() function, 158

finding values within lists, 178-179

fiscal month, determining with CHOOSE() function, 198-199

fiscal quarter of a date, calculating, 249

FIXED() function, 151

fixed-rate loan amortization schedule, creating, 457

floating holiday dates, calculating, 227-228

FLOOR() function, 249

forecast trend, calculating, 403

Forecast workbook, 401

forecasting

- for seasonal sales model, case study, 400-408
- with LINDEX() function, 399
- with regression equation, 398
- with TREND() function, 398

forecasting business performance, regression analysis, 385**forecasting values, plotting, 395-396****Form controls, 105****formatting. *See also* conditional formatting**

- Currency format, applying to numeric values, 150
- date and time, 215
- ledger shading, 257-258
- numeric values, 151
- tables, 301
- time and date, 152

Formula AutoComplete feature, 318**formula bar, Name box, 38-39****formula error checker, 122**

- error action, selecting, 123
- options, selecting, 123-126

formulas

- absolute reference format, 66
- arithmetic, 57-58
- array formulas
 - constants, 93
 - operating on multiple ranges, 91-92
- arrays, selecting, 91
- circular reference formulas, 95-96
- comparison formulas, 58
- conditional formatting, applying, 175-176
- converting to values, 67-68
- copying, 64
 - maintaining relative reference format, 66-67
- displaying, 67
- editing, 57
- entering, 56
- iteration, 95
- line breaks, creating, 56
- links, 72
 - external references, syntax, 73-74
 - source, changing, 75
 - updating, 74-75
- naming, 72
- nesting levels, 56

numeric formats

- customizing, 79-82
- specifying, 77-79
- symbols used, 80-81
- zeros, hiding, 82
- operators, order of precedence, 59-62
- range names, 68
 - applying, 69-71
 - pasting, 68-69
- reference formulas, 59
- relative reference format, 65
- structure of, 55
- text formulas, 59

fraction formats, 76**frequency distributions, 275**

- FREQUENCY() function, 275-276
- KURT() function, 279-280
- normal distribution, 276, 278
- SKEW() function, 278-279

FREQUENCY() function, 275-276**functions, 136**

- arguments, 135
- array-utilizing, 94
- date-related, 216-217
- information functions, 184
 - ERROR.TYPE() function, 188-189
 - CELL() function, 186-187
 - INFO() function, 189
 - IS() function, 191-193
- Insert Function feature, 138-140
- logical functions, 167
 - AND() function, 172
 - IF() function, 171
 - OR() function, 174
- structure of, 134
 - placeholders, 135-136
- syntax, 135

future dates, returning, 221-223**future time, returning, 236-237****future value, 450**

- as goal
 - required initial deposit, calculating, 477-478
 - required interest rate, calculating, 474-475
 - required number of periods, calculating, 475
 - required regular deposit, calculating, 476-477

- calculating, 472-473, 484
 - with varying interest rates, 478
- of lump sum, calculating, 473-474
- of series of deposits, calculating, 473-474

FV() function, calculating future value, 472-474

G

General number format, 76

generating

- account numbers, case study, 158-161, 165
- ANSI character set, 145
- ANSI code, 148
- random letters, 260-261
- random numbers, 259
- scenario summaries, 380-382
- series of letters, 147-148

GETPIVOTDATA() function, 196, 357

GIGO effect, 102

Go To command, selecting cells, 10

Go To Special dialog box, selecting cells, 11-15

- shortcut keys, 14

Goal Seek feature, 367

- algebraic equations, solving, 373-374
- break-even analysis, performing, 372-373
- iterative calculation approximations, 371-372
- preparing for use, 368
- profit margin, optimizing, 370-371
- running, 368-369

grand totals, hiding in PivotTables, 341

group boxes, 107

groupable data, 335

GROWTH() function, calculating

- exponential trend, 412-414

H

hiding PivotTable grand totals, 341

highlight cells rules, creating, 24-26

Histogram tool (Analysis ToolPak), 287-288

HLOOKUP() function, 196, 202

- exact-match lookups, performing, 204-206
- discount rate, returning, 202-203
- tax rates, returning, 203

holidays

- Easter dates, calculating, 250
- floating holiday dates, calculating, 227-228

HOUR() function, 235

hurdle rate, 490

I

icon sets, adding, 33-34

IF() function, 168-169

- #DIV/0 function, troubleshooting, 170
- FALSE results, handling, 170-171
- multiple logical tests, performing, 171
- nesting, 171
- tiered payments, calculating, 172

IFERROR() function, 121-122, 203

Ignore Relative/Absolute option, 70

ignoring range errors, 192

income tax rates, returning with range lookup, 203

independent variables, 385

index summary calculations, performing on PivotTable data fields, 348-350

INDEX() function, 196, 206-209

- list boxes, performing lookups on, 208
- multiple column lookups, creating, 210-211
- row-and-column lookups, creating, 209-210

indirect precedents, 13

inflation, 484

INFO() function, 189

information functions, 184

- CELL() function, 186-187
- ERROR.TYPE() function, 188-189
- INFO() function, 189
- IS() function, 191-193

input modes, 56

Insert Function feature, 138-140

inserting

- calculated items into PivotTables, 353-354
- PivotTable results into worksheets, 357-358

installing

- Analysis ToolPak, 140-141
- Solver, 429

INT() function, 251

integrating CHOOSE() function with worksheet option buttons, 200
interest costs, calculating, 453-455
interest rate, 469
 calculating, 461-462
 for future value goal, 474-475
 compound, 470
 effective, 470-471
 converting to nominal, 471-472
 nominal, 470
 converting to effective, 471-472
internal rate of return
 calculating, 496-497
 for nonperiodic cash flows, calculating, 498
 multiple, calculating, 498-499
intersection operator, 52-53
investing versus purchasing rental property, 486-487
investment schedule, building, 479-481
investments, calculating future value, 472-474
 with varying interest rates, 478
IRR() function, calculating internal rate of return, 497
IS() function, 191-193
Iteration, 95
iterative calculation approximations, 371-372

J-K

Julian dates, calculating, 229

keyboard range-selection tricks, 9
keyboard shortcuts for specifying numeric formats, 79
KURT() function, 279-280
kurtosis, 279

L

labels, 334
LARGE() function, 270-271
layout, 335
leasing versus purchasing, 487-488

ledger shading, creating, 257-258
LEFT() function, 156
LEN() function, 164
limits of Excel 2007 formulas, 56
line breaks, creating, 56
line feeds, removing, 164
linear data, regression analysis
 best-fit trendline, plotting, 386-399
 regression equation, displaying, 389
linear trends, extending
 with fill handle, 396
 with Series command, 396-397
LINEST() function
 best-fit values, calculating, 391-393
 business forecasting, 399
linking controls to cell value, 106-107
links, 72
 external references, syntax, 73-74
 source, changing, 75
 updating, 74-75
list boxes, 109-110
 performing lookups on, 208
list values
 position, determining, 181-182
 searching for, 178-179
loading
 Analysis ToolPak, 140-141
 Solver, 429
loan amortization schedules, creating
 dynamic, 458-459
 fixed-rate, 457
 variable-rate, 464-465
loan payment analysis, 451-452
 balloon loans, 452-453
 cumulative principal and interest, 455-456
 interest costs, 453-455
 interest rate, 461-462
 maximum principle, 462-463
 principal and interest, 453-454
 term of loan, 459-461
locating values within lists, 178-179
logarithmic trend, 415
 calculating, 416-417
 trendline, plotting, 415

logical functions, 167

- AND() function, 172
- combining with arrays, 177-182
- IF() function, 168-171
 - #DIV/0 error, troubleshooting, 170
 - FALSE results, handling, 170-171
- OR() function, 174

logical tests, performing, 171

- using AND() function, 172
- using IF() function, 171
- using OR() function, 174

lookup functions, CHOOSE(), 197

- day of week, determining, 198
- month of fiscal year, determining, 198-199
- weighted questionnaire responses, calculating, 199

lookup tables, 196

- HLOOKUP() function, 202
 - exact-match lookups, performing, 204-206
 - discount rate, returning, 202-203
 - tax rates, returning, 203
- VLOOKUP() function, 201
 - tax rates, returning, 203
 - discount rate, returning, 202-203
 - exact-match lookups, performing, 204-206

LOOKUP() function, 196**LOWER() function, 149****lump sums, calculating future value, 473-474**

M

maintaining, relative reference format during copy operations, 66-67**manual calculation mode, selecting, 63****MATCH() function, 196, 206-209**

- multiple column lookups, creating, 210-211
- row-and-column lookups, creating, 209-210

math-related functions, 243

- CEILING(), 249
- EVEN(), 250
- FLOOR(), 249
- INT(), 251
- MOD(), 255-257
- MROUND(), 248
- ODD(), 250
- RAND(), 259-260

RANDBETWEEN(), 261

- ROUND(), 247
- ROUNDDOWN(), 248
- ROUNDUP(), 248
- SUM(), 253
- TRUNC(), 251

MAX() function, 269-270**maximum principle, calculating, 462-463****measures of central tendency, 272****measures of variation**

- range, calculating, 272
- variance, calculating, 272-273

MEDIAN() function, 267**merging scenarios, 379-380****messages, Solver, 438-439****MID() function, 156****MIN() function, 269-270****MINUTE() function, 235****MIRR() function, 499****mismatched parentheses, troubleshooting, 118-119****MOD() function, 255-257****MODE() function, 268****money, time value of, 449-450****month of fiscal year, determining with CHOOSE() function, 198-199****MONTH() function, 219****mortgages, allowing principal paydown, 465-467****mouse range-selection tricks, 8****MROUND() function, 248****multiple-column lookups, creating, 210-211****multiple logical tests, performing**

- using AND() function, 172
- using IF() function, 171
- using OR() function, 174

multiple regression analysis, 386, 423-425

- operations research, 427

multisheet data, consolidating, 97

- by category, 101-102
- by position, 97, 99-100

multithreaded calculation, enabling, 63

N

Name AutoComplete feature, 137

Name box, 38-39

Name Manager feature, 48

naming
 constants, 44-45
 formulas, 72

navigation keys for selected ranges, 15

negatively skewed values, 278

nesting
 IF() function, 171
 Parentheses, 62

nesting levels, 56

net present value, calculating, 489
 with nonperiodic cash flows, 492-493
 with NPV() function, 490-491
 with varying cash flows, 491-492

New Name dialog box
 constants, naming, 44-45
 range names, defining, 40-41

nominal interest, 470
 converting to effective, 471-472

non-numeric values, checking for in ranges, 192

nonlinear data, regression analysis
 exponential trend, 409-414
 logarithmic trend
 calculating, 416-417
 trendline, plotting, 415
 power trend, 417
 calculating, 419-420
 trendline, plotting, 418-419

nonprintable characters, removing from strings, 153

normal distribution, 276-278

normal trend, calculating, 402

NORMDIST() function, 276-278

NOW() function, 151, 234

NPV() function, calculating net present value, 490-491

number filters, 308

numeric formats, 76
 changing, 77
 condition values, 83

customizing, 79-82
 specifying, 77-79
 symbols used, 80-81
 syntax, 79
 zeros, hiding, 82

numeric values
 counting, 266
 Currency format, applying, 150
 Formatting, 151
 within strings, formatting, 151

O

occurrences of values, counting within ranges, 180

ODD() function, 250

one-input data tables, setting up, 362

operands, 55

operators, 55
 & (ampersand), 59
 in arithmetic formulas, 57-58
 intersection, 52-53
 order of precedence, 59
 controlling, 60-62

optimizing profit margin with Goal Seek, 370-371

option buttons, 107-108

options (Solver), 435-436

OR() function, performing multiple logical tests, 174

order of precedence, 59-60
 controlling, 60-62

outliers, 31

overlapping cells, intersection operator, 52-53

P

padding cells, 154

parentheses
 nesting, 62
 order of precedence, controlling, 61-62

pastings range names
 lists, 48
 into formulas, 68-69

payback period

- discounted, calculating, 496
- exact undiscounted, calculating, 495
- undiscounted, calculating, 494

percentage formats, 76**percentage summary calculations, performing on PivotTable data fields, 344****PercentMin property (Databar object), setting, 29****performing**

- break-even analysis with Goal Seek, 372-373
- calculations
 - in Solver, 430-431
 - on bottommost values, 271
 - on topmost values, 271

PivotTables, 331

- Building, 335-338
 - from external databases, 338-339
 - from ranges 335-338
- calculated fields, creating, 352-353
- calculated items, creating, 353-354
- calculations, customizing, 350
- customizing, 339-340
- data fields
 - difference calculations, 342-343
 - index summary calculations, 348-350
 - percentage summary calculations, 344
 - running total summary calculations, 347
 - summary calculation, changing, 341
- grand totals, hiding, 341
- results, inserting into worksheets, 357-358
- subtotals
 - calculation of, customizing, 341
 - hiding, 341

placeholders, 135-136**plotting**

- exponential trendline, 410
- forecasting values, 395-396
- logarithmic trendline, 415
- polynomial trendline, 421-422
- power trendline, 418-419

Point mode, 57**polynomial regression analysis, 386, 420**

- polynomial trend values, calculating, 422-423
- polynomial trendlines, plotting, 421-422

position of values within lists, determining, 181-182**positively skewed values, 278****power trend, 417**

- calculating, 419-420
- power trendline, plotting, 418-419

precedents, 13, 126

- tracing, 127

predefined table specifiers, 316-318**preparing**

- to use Goal Seek, 368
- worksheets for scenarios, 376

present value, 450

- calculating, 484-486

price points, setting, 252**principal and interest, calculating, 453-454****principal paydown, allowing on mortgages, 465-467****profit margin, optimizing with Goal Seek, 370-371****PROPER() function, 149****publishing a book, cash flow analysis, 499-502****PV() function**

- comparing purchasing and leasing, 487
- present value, calculating, 485-486

Q-R

Quarterly data, performing calculations on, 408**quick filters, 308**

- wildcard characters, 309-310

RAND() function, 259-260**RANDBETWEEN() function, 261****random letters, generating, 260-261****Random Number Generation tool (Analysis ToolPak), 289-291****random numbers, generating, 259****range names, 44**

- advantages of, 37
- applying to formulas, 69
 - Ignore Relative/Absolute option, 70
 - Use Row and Column Names check box, 70-71

AutoComplete feature, 47
 changing, 51
 coordinates, adjusting, 50-51
 defining, 38-41
 deleting, 52
 editing, 49
 filtering, 49
 Name Manager, 48
 pasting into formulas, 68-69
 pasting list of, 48
 redefining, 116-117
 referring to, 46-47
 scope, defining, 41
 selecting, 48

ranges

3D ranges, 9-10
 advanced copying techniques, copying cell
 attributes, 20-22
 arithmetically combining, 22
 blanks, counting, 191
 calculating, 272
 clearing, 23
 color scales, applying, 31-33
 conditions, applying to cells, 177-178
 converting to a table, 299-300
 data bars
 applying, 28
 customizing, 30-31
 errors, 192
 fill handle, 16-17
 filling, 16
 icon sets, 33-34
 navigation keys, 15
 non-numeric values, checking for, 192
 occurrences, counting, 180
 PivotTables, building, 335-338
 series, creating, 19-20
 values, summing, 255

Rank and Percentile tool (Analysis ToolPak), 292-294

RATE() function, 475

recalculating formulas, 63

records, 297

adding to table, 300
 deleting, 301
 selecting, 300

redefining range names, 116-117

reference formulas, 59

referencing tables with predefined specifiers, 316-318

referring to range names, 46-47

regression analysis, 385

advertising trend, analyzing, 394
 forecasted values, plotting, 395-396
 linear trends, extending
 with fill handle, 396
 with Series command, 396-397
 multiple regression analysis, 423-425
 on linear data
 best-fit trendline, plotting, 386-399
 regression equation, displaying, 389
 on nonlinear data
 exponential trend, 409-414
 logarithmic trend, calculating, 415-417
 logarithmic trendline, plotting, 415
 power trend, calculating, 417-420
 power trendline, plotting, 418-419
 polynomial regression analysis, 420
 polynomial trend values, calculating, 422-423
 polynomial trendline, plotting, 421-422
 sales trend, analyzing, 394

regression equation

coefficient of determination, 389
 displaying, 389
 forecasting, 398

relative reference format, 65

maintaining during copy operations, 66-67

removing

characters from string, 163-164
 excess spaces within strings, 152
 line feeds, 164
 nonprintable characters from strings, 153
 tracer arrows, 128

renaming tables, 301

repeating characters, 153

REPLACE() function, 162-163

replacing text, 162-163

report filters, 334

REPT() function, 153-155

required deposits, calculating for future value goal

initial deposit, 477-478
 number of periods, 475
 regular deposit, 476-477

reseasoned trend, calculating, 407
 resizing tables, 301
RIGHT function, 156
 risk premium, 450
ROUND() function, 247, 252
ROUNDDOWN() function, 248
ROUNDUP() function, 248
 rounding, 251-252
 billable time, 253
 rounding functions
 CEILING(), 249
 FLOOR(), 249
 MROUND(), 248
 ROUND(), 247
 ROUNDDOWN(), 248
 ROUNDUP(), 248
 row fields, 334
 row-and-column lookups, creating, 209-210
 rows
 ledger shading, creating, 257-258
 transposing with columns, 23
RTD() function, 196
 rules
 changing, 28
 data-validation rules, applying to cells, 102-105
 highlight cell rule, creating, 24, 26
 top/bottom rules, creating, 26, 28
 running Goal Seek, 368-369
 running total summary calculations
 performing on PivotTable data fields, 347

S

sales trend, analyzing, 394
 saving Solver solutions as scenarios, 434
Scenario Manager, 375. *See also* scenarios
 deleting scenarios, 382
 editing scenarios, 379
 displaying scenarios, 378-379
 merging scenarios, 379-380
 scenarios, 375
 adding to worksheets, 376-378
 Solver solutions, saving as, 434
 summary reports, generating, 380-382
 worksheets, preparing for, 376
 scientific formats, 76
 scope of range names, defining, 41
 scroll bars, 110-111
SEARCH() function, 158
 searching
 for values within lists, 178-179
 for substrings, 158
 seasonal forecast, calculating, 408
 seasonal index, calculating, 405-406
 seasonal trend, calculating, 404
SECOND() function, 236
 selecting
 arrays, 91
 calculation mode, 63
 cells
 keyboard range-selection tricks, 9
 mouse range-selection tricks, 8
 with Go To command, 10
 with Go To Special Dialog box, 11-15
 ranges, 48
 Solver options, 436
 Solver saved models, 437-438
 specifiers, 318
Sensitivity report (Solver), displaying, 443-445
 sentence case, applying to text, 156
 serial numbers, 213
 series
 AutoFill feature, 16-17
 creating, 19-20
 letters, generating, 147-148
Series command, extending linear trends
 with fill handle, 396
 with Series command, 396-397
 setting up worksheets for Goal Seek, 368
 sheet-level names, 47
 shortcut keys for Go To Special operations, 14
 simple regression, 386
SKEW() function, 278-279
SMALL() function, 270-271
Solver
 advantages of, 428
 calculations, performing, 430-431
 changing cells, 428

- constraints, 428
 - adding, 432-434
 - loading, 429
 - messages, 438-439
 - options, 435-436
 - Parameters dialog box, 431
 - reports, displaying
 - Answer report, 442-443
 - Sensitivity report, 443-445
 - saved models, selecting, 437-438
 - solutions, saving as scenarios, 434
 - transportation problem, solving, 439-441
 - when to use, 428
- solving algebraic equations with Goal Seek, 373-374**
- sorting**
 - fields, excluding articles, 305
 - partial fields, 304-305
 - tables, 301-302
 - in natural order, 303-304
 - values randomly, 260
- source workbooks, 73**
- special formats, 76**
- specifiers, 316-318**
- specifying numeric formats, 77-78**
 - keyboard shortcuts, 79
- spin boxes, 110-111**
- standard deviation, calculating, 273-274**
- standard normal distribution, 276**
- statistical functions, 263, 265**
 - AVERAGE(), 267
 - COUNT() function, 266
 - FREQUENCY(), 275-276
 - KURT(), 279-280
 - LARGE(), 270-271
 - MAX(), 269-270
 - measures of variation, 272-273
 - MEDIAN(), 267
 - MIN(), 269-270
 - MODE(), 268
 - NORMDIST(), 276, 278
 - SKEW(), 278-279
 - SMALL(), 270-271
 - STEV(), 274
 - STEV() function, 273-274
 - VARP(), 273
 - weighted mean, calculating, 269
- statistical tools (Analysis ToolPak), 280-282**
 - correlation coefficient, calculating, 285-287
 - Descriptive Statistics tool, 283-284
 - Histogram tool, 287-288
 - loading, 140-141
 - Random Number Generation tool, 289-291
 - Rank and Percentile tool, 292-294
- STEV() function, 274**
- STEV() function, 273-274**
- strings**
 - characters, removing, 163-164
 - concatenating, 59
 - excess spaces, removing, 152
 - nonprintable characters, removing, 153
 - numbers, formatting, 151
 - repeating, 153
 - substrings
 - extracting, 155-156
 - searching for, 158
- structure**
 - of formulas, 55
 - of functions, 134
 - arguments, 135
 - placeholders, 135-136
 - syntax, 135
- SUBSTITUTE() function, 163**
- substrings**
 - extracting, 155-156
 - replacing with another, 162-163
 - searching for, 158
- subtotals**
 - customizing PivotTable calculation, 341
 - hiding in PivotTables, 341
- subtracting dates from other dates**
 - DATEDIF() function, 229-231
 - DAYS360() function, 232
- SUM() function, 253**
- SUMIF() function, 321**
- SUMIFS() function, 324**
- summary calculations (PivotTables)**
 - difference summary calculations, 342-343
 - index summary calculation, 348-350
 - percentage summary calculations, 344
 - running total summary calculation, 347
- summary statistics. *See* descriptive statistics**
- summing time values, 237**
- summing values in a range, 255**
- symbols for numeric formatting, 80-81**
 - condition values, 83

syntax

- for CHOOSE() function, 197
- for external references, 73-74
- for HLOOKUP() function, 202
- for IFERROR() function, 121
- for INDEX() function, 207
- for MOD() function, 255
- for numeric formats, 79
- for REPLACE() function, 162-163
- for TRIM() function, 152
- for VLOOKUP() function, 201
- of functions, 135
 - to sentence case, 156
 - to upper case, 149
- formatting, DOLLAR() function, 150
- replacing, 162-163

text filters, 308**text formulas, 59****text strings, concatenating, 59****TEXT() function, 151-152****text-based charts, building, 154-155****tiered payments, calculating, 172****time and date, formatting, 83-84, 152**

- customizing, 85-86

time serial numbers, obtaining, 213**TIMEVALUE () function, 235****time value of money, 449-450****time values, summing, 237****TIME() function, 234****time-related functions**

- future time, returning, 236-237
- HOUR(), 235
- MINUTE(), 235
- NOW(), 234
- SECOND(), 236
- TIME(), 234
- TIMEVALUE(), 235

TODAY() function, 218**top/bottom rules, creating, 26-28****topmost values, performing calculations on, 271****tracers, 126**

- removing, 128

tracing

- cell dependents, 127
- cell errors, 127
- cell precedents, 127

transportation problem, solving with Solver, 439-441**transposing rows and columns, 23****trend analysis for seasonal sales model, case study, 400-408****TREND() function**

- best-fit values, calculating, 390-391
- business forecasting, 398

trigonometric functions, 246**T****table functions**

- AVERAGEIF(), 322
- AVERAGEIFS(), 324
- COUNTIF(), 321
- COUNTIFS(), 323
- DAVERAGE(), 327
- DGET(), 327
- SUMIF(), 321
- SUMIFS(), 324

table ranges, 297**table specifiers, 316, 318****tables. See also PivotTables**

- basic operations, 300
- fields, 297
 - sorting on part of, 304-305
- filter criteria, 308
- filtered data, copying, 315
- filtering, 306-308
 - with complex criteria, 310-313
 - with computed criteria, 313-314
- formatting, 301
- formulas, entering, 318
- renaming, 301
- resizing, 301
- row totals, displaying, 301
- selecting, 300
- sorting, 301-302
 - in natural order, 303-304

tax rates, returning with range lookup, 203**term of loan, calculating, 459, 461****text**

- converting
 - to lower case, 149
 - to proper case, 149

TRIM() function, 152**troubleshooting**

- circular references, 120-121
- erroneous formula results, 119-120
 - #DIV/0! error, 114, 170
 - #N/A error, 115
 - #NAME? error, 115-117
 - #NULL! error, 117
 - #NUM! error, 117
 - #REF! error, 117-118
 - #VALUE! error, 118
- mismatched parentheses, 118-119
- using formula error checker, 122-126

TRUNC() function, 251**two-column lookups, performing, 211****two-digit years, 215-216****two-input data tables, setting up, 365-367****U****undiscounted payback period, calculating, 494****upcoming dates and times, returning, 221-223, 236-237****updating links, 74-75****UPPER() function, 149****V****values**

- occurrences of, counting within ranges, 180
- position within list, determining, 181-182
- summing, 255

variable-rate amortization schedule, building, case study, 464-465**variance**

- anova, 281
- calculating, 272-273

VARP() function, 273**VBA, setting PercentMin property (Databar object), 29****VLOOKUP() function, 196, 201**

- discount rate, returning, 202-203
- exact-match lookups, performing, 204-206
- tax rates, returning, 203

W**Watch Window, 129****WEEKDAY() function, 220-221****weekdays, returning *n*th occurrence in month, 224-227****weighted mean, calculating, 268-269****weighted questionnaire responses, calculating with CHOOSE() function, 199****what if analysis, 361**

- data tables
 - editing, 367
 - formulas, adding, 364-365
 - setting up, 362-367

wildcard characters, 309-310**workbooks, linking, 72**

- external references, syntax, 73-74
- source, changing, 75
- updating, 74-75

WORKDAY() function, 222**workdays between two dates, calculating, 231****worksheet controls. *See also* worksheets**

- adding to worksheets, 106
- check boxes, 108
- combo boxes, 109-110
- group boxes, 107
- linking to a cell value, 106-107
- list boxes, 109-110
- option buttons, 107-108
- scroll bars, 110-111
- spin boxes, 110-111

worksheets

- auditing, 126
- PivotTable results, inserting, 357-358
- scenarios
 - adding, 376-378
 - deleting, 382
 - displaying, 378-379
 - editing, 379
 - merging, 379-380
 - preparing for, 376

X-Y-Z

x-value. *See* independent variables

XNPV() function, 493

y-value. *See* dependent variables

YEAR() function, 219

YEARFRAC() function, 232-233

YYYYMMDD date format, converting to
recognizable format, 157

zeros, hiding, 82