

# Index

## A

- (a + b) operator, 143
- absolute value, method call, 143
- abstract class, functions of, 250
- access controls
  - ActionScript 3.0 new features, 62
  - with classes, 58–67
  - and encapsulation, 61
  - functions of, 9–10
  - internal, 10, 63–64
  - namespaces, 64–67
  - private, 10, 59–61
  - protected, 10, 61–63
  - public, 10, 59–61
- Access operators, XML, 185
- accessors, 70–73
  - explicit accessors, 70–71
  - functions of, 70–71, 77
  - implicit, 72–73
  - static accessors, 83
- ActionScript
  - ActionScript 3.0 new features, 4–6, 243
  - animation, 583–587
  - application building tools, 4
  - capabilities of, 3–4
  - case-sensitivity, 119
  - functions, calling from JavaScript, 682–683
  - and XML. *See* E4X; XML
- ActionScript Message Format (AMF)
  - benefits of, 448
  - Flash Remoting, 448, 450–452
- ActionScript Virtual Machine 2 (AVM2), and
  - debugging, 393–394
- activity detection, microphone, 518
- Add BlendMode, 253
- addChild, 267–268
- addEventListener (), 343, 345
- addition operator (+)
  - arithmetic operation, 18, 142
  - text concatenation, 127
- addNamespace (), 207
- addPage (), 287, 289
- addParam (), 675–676
- addVariable (), 677
- Adjust Color filter, 541
- Adobe Acrobat, PDF files, benefits to use, 286–287
- Adobe AIR, error log method, 417
- Adobe Document Server, 286
- AIM client, 667
- aliasing, printing, 290
- alignment
  - img tag, 304
  - Stage, 256–257
  - TextFormat, 307
- allowDomain, 691
- allowInsecureDomain, 691
- alpha
  - displacement filter, 544
  - drop shadow filter, 529
  - glow filter, 532
  - gradient bevel filter, 533
  - line gradient, 560
  - line style, 550

## A

## Index

- alphaArray, 644
- alphaBitmapData, 628
- Alpha BlendMode, 253
- alphaPoint, 629
- altKeyBoolean, 356–357
- ampersand (&&), And operator, 21–22
- ancestors, XML, accessing, 191–192
- anchors
  - multiline flag (m), effects on, 230
  - regular expressions, 225–227
- And operator (&&), 21–22
- angles
  - bevel filters, 530
  - drop shadow filter, 528
  - gradient bevel filter, 533
  - trigonometric method calls, 144
- animation, 581–600
  - with ActionScript, 583–587
  - with AnimationPackage, 600
  - with Flash CS3 Professional. *See* animation, Flash; motion XML
  - with Flex Builder, 599
  - frame rate, 581–582, 585–586
  - frame, rendering, 582–583
  - MovieClip, 268–269
  - speed, determining, 585–587
  - timeline animations, 584, 587
  - with Timer object, 584–585
  - with Tweeners, 599–600
- animation, Flash, 587–598
  - easing, 588
  - Flash CS3 Professional new features, 587
  - with Flash motion package, 599
  - keyframes, 588
  - motion XML, 588–598
  - timeline animations, 587
  - tweens, 588
- AnimationPackage, 600
- Animator class, methods, 597–598
- antialiasing, 314–315
- appendChild ( ), 202
- appendText, 300
- apply ( ), 111
- arccosine, 144
- arcsine, 144
- arctangent, 144
- argument(s)
  - adding to functions, 97
  - ArgumentError, 389
  - colon with, 98
  - default value, setting, 100–101
  - errors related to, 120
  - and event handling, 337
  - matching function definition, 98
  - named, objects used as, 179–180
  - with operators, correct number, 17
  - parentheses with, 96, 97, 98
  - passing to functions, 98–102
  - rest parameter (...), 101, 101–102
  - in strict mode, 102
  - TypeError, 389
  - values, extracting from, 102
- ArgumentError, 384, 389
- arguments.caller, 102
- arithmetic
  - date arithmetic, 150
  - Math class arithmetic, 143
  - operators, 18, 142–143

- array(s), 153–171
  - access all items, for loop, 161
  - adding arrays, 157–158
  - array access notation, 658
  - array access operator ([ ]), 156
  - Array constructor, 153–155
  - array literals, 9, 155
  - associative arrays, 169
  - byte arrays, 657–665
  - conditional processing, 166–168
  - conserving/resusing code, forEach ( ), 162
  - converted from strings, 127
  - converting to strings, 156–157
  - dictionary, 169–170
  - flipping order of, 163
  - functions of, 25, 176
  - information, adding to, 153–155
  - item renderer, creating, 270–271
  - length, 25, 155, 156
  - and loops, 26–27
  - multidimensional arrays, 170–171
  - new array, map ( ), 168–169
  - number of items, finding, 156
  - pattern matching, 131
  - queue operations, shift ( ) and unshift ( ), 159–160
  - sorting, 163–166
  - splicing, 160
  - stack operations, push ( ) and pop ( ), 158–159
  - subset, extracting, 160–161
  - value to variable, assigning, 155
  - values, appending to end of, 157–159
  - values, referencing, 156
  - values, searching for, 162
- array literals
  - creating array, 155
  - square brackets with, 9, 155
- artwork, printing, 290–292
- .as files, classes, 37
- ascent, TextMetrics, 321
- ASCII code
  - converting characters to, 129
  - escape character for, 125, 222
- assignment, within conditional, C1100 error, 119
- associative arrays
  - alternatives to, 169
  - avoiding, reasons for, 169
  - code, example of, 169
  - dictionary, 176
  - functions of, 175
  - key-value pairs, 175, 177–179
  - objects used as, 175–176
- asterisk (\*)
  - multiplication operator, 18
  - regular expression quantifier, 225
  - wildcard (\*) data type, 17
  - wildcard (\*) operator, 45–46
- asynchronous errors, 390–392
- @ operator, XML
  - attributes, accessing with, 189
  - functions of, 185
- attachCamera, 505
- attachNetStream, 505
- attachVideo, 507
- attributes, XML
  - accessing, 189
  - defined, 183–184
- audio. *See* sound
- autoRewind, 598
- autoSize, TextField, 300–301

**B** Index**B**

- background
  - fills, 254
  - TextField, 305–306
- background colors
  - backgroundColor, 305
  - printing issue, 291
- backreferences, regular expressions, 233–234
- backslash (/)
  - with backreference, 234
  - with escape characters, 124, 221–222
- backspace, escape character, 124, 222
- backtrace, 407
- ball, bouncing, creating, 272–273
- bandwidth use
  - and Flash Media Server, 502
  - FLV files from HTTP, 503
- base class
  - empty, benefits of, 83–84
  - overriding methods of, 73–74
  - use, example of, 75–76
- base types, defined, 37
- baseX/baseY, Perlin noise, 648
- beginBitmapFill ( ), 556, 558–559
- beginFill ( ), 254, 555–556
- beginGradientFill ( ), 563–564
- bevel filters, 530–531
- Bezier curve
  - BezierEase tween, 596
  - motion XML, 595–597
- bias, convolution filter, 542
- binary data. *See* binary sockets; byte arrays
- binary operators, defined, 17
- binary sockets, 665–667
  - application building with, 667
  - connection to server, 665–666
  - disconnect from server, 667
  - listen for messages, 666
  - send messages to server, 666
- bitmap(s)
  - detect areas by color, 637–639
  - and filters, 527
  - graphics, drawing. *See* BitmapData
  - graphics, importing, 282
  - print targets as, 290
  - printing, 290
  - rotation effect, 546–547
- BitmapData, 615–653
  - bitmap fill, 556–560
  - channels, copying, 630–632
  - constructing with constructor method, 616
  - constructing with embedded assets, 616–617
  - display objects, copying images from, 619–624
  - filters, applying to, 652–653
  - image smoothing, 619
  - images, displaying, 618–619
  - loading images to, 624–626
  - merging images, 632–634
  - noise, applying, 646–653
  - objects, cloning, 626
  - objects, drawing into, 627–628
  - pixel snapping, 618–619
  - pixels, copying, 628–630
  - pixels, getting/setting, 634–635
  - read-only properties, 619
  - rotation, 546
- bit math, unit type, 138
- black box principle, 40
- blank, Keyframe, motion XML, 593
- blend modes, 252–253
  - draw ( ), 620

- Keyframe, motion XML, 593
  - listing of, 253
  - operation of, 252
- block(s)
  - block-level variables, 13
  - package block, 43–44
  - sub-procedures, 105
  - See also* function(s); methods
- block comments
  - starting/ending marker, 32
  - uses of, 32
- blockIndent, TextFormat, 308
- blueArray, 644
- blueMultiplier, 633
- blur filters, 527–528
- blurX and blurY
  - bevel filters, 530
  - blur filters, 527
  - drop shadow filter, 529
  - glow filter, 532
  - gradient bevel filter, 533–534
- boldface
  - HTML tag, 303
  - TextFormat, 308
- Boolean values
  - conditionals, 19–25
  - true and false, 9, 19
- borders, color, 306
- bottomLeftRadius/upperLeftRadius, rounded
  - rectangles, 567
- bouncing ball, creating, 271–273
- boundaries, regular expressions, 225–227
- break
  - with loops, 31
  - with switches, 23
- breakpoint
  - BreakpointExample, 404
  - debugger halting at, 401–402
  - defined, 400
  - setting, 400–401
- brightness, colors, 540, 594
- browse ( ), uploading files, 474–476
- browsers
  - cookies and storage, 456
  - and debugging, 398
  - and ExternalInterface, 681
  - See also* URL
- bubble phase, event flow, 345–346
- buffer, sound stream, 488–489
- bufferlength, NetStream, 505
- bufferTime, NetStream, 505
- bullets
  - HTML tag, 303
  - TextFormat, 308
- button(s), SimpleButton, 257–258
- buttonMode, 264
- byte arrays, 657–665
  - for computing sound spectrums, 659–660
  - to copy objects, 661–662
  - creating, 657
  - indexes, storage, 658
  - to load images, 660–661
  - reading from, 658
  - serialization of data, 662–665
  - sound spectrum, computing with, 497–498
  - writing data to, 658
- bytecodes, 393
- bytesAvailable, 666
- bytesLoaded, 431, 479, 496
  - NetStream, 505

**B** Index

bytesTotal, 431, 479, 496  
 NetStream, 505

**C**

cacheAsBitmap, 527

call (), 111

call stack

- and debugging, 405–407, 411
- runtime errors, 117–118
- stack trace, 406–407

calling

- call method, NetConnection, 449
- call operator, 96
- defined, 96
- functions, 96–97

camera, 515–517

- attaching to video, 516–517
- dimensions, 516
- and media servers, 521–522
- motion level, setting, 516
- muted and unmuted, 516
- object, creating, 515–516

cancelable, 349

cap styles, lines, 552–553

capture phase, event flow, 344

caret (^)

- as anchor, 227
- with character classes, 223–224
- restrict character in TextField, 317–318

carriage return, escape character, 124

Cartesian co-ordinates, hitTestPoint, 265

case of string, converting, 128

case sensitivity

- case-insensitivity flag (i), 214, 229
- case-sensitivity, ActionScript 3.0, 119
- sensitivity and sorting, 165

casting

- explicit method, 142
- strings, numeric conversions, 141–142

catch blocks, 382–385, 416

CatchBlocksExample (), 385

centered text, TextFormat, 307

change event, TextField, 325

channels

- channelOptions, 646, 649
- copying, BitmapData, 626, 630–632
- noise, 648

character(s)

- accessing from strings, 129
- converting to ASCII code, 129
- measure, TextMetrics, 322
- restricting in TextField, 317–318

character classes

- characters/meaning, 224
- regular expressions, 223–224

charCode, 363–364

checkPolicyFile, img tag, 304

child class. *See* subclass

children, Sprite, swapping depths, 266

children, XML

- accessing, 188–189
- iteration through, 192

circles, drawing, 565–566

clamp, convolution filter, 542

class(es), 35–94

- access control attributes with, 9–10, 58–67
- .as files, 37
- base class, 6, 75–76
- constant statements of, 8–9
- constructors, 68–69
- dynamic classes, 94, 173–174
- encapsulation, 39–41

- extending with inheritance, 62
  - final, 57–58, 81
  - fully qualified name of, 41
  - functions of, 36–38
  - importing from packages, 44–47
  - inheritance, 47–58
  - interface design, 83–89
  - location, folders for, 43
  - methods in, 67–69, 96
  - Object class, 38
  - in object-oriented programming, 38
  - and objects, 38, 39
  - overriding methods of, 73–75
  - packages, 41–47
  - polymorphism, 41
  - properties in, 69–73
  - as real world modeling, 35–36
  - as types, 37, 89–94
  - visibility of, 43
  - XML, 186–187
- class variable, use, determining, 15
- clear ( )
  - NetStream, 505
  - SharedObject, 459
- clearInterval ( ), 375
- click event, 260, 357
- client, NetStream, 506
- client-side technology, Flash Player as, 443
- clipRect, draw ( ), 620
- cloning, BitmapData, 626
- close ( )
  - disconnect from server, 666
  - local connections, 689
  - URLLoader, 432
- close method
  - NetConnection, 449
  - NetStream, 506
- collision of clips, checking for, 273–275
- colon (:)
  - with arguments, 98
  - in conditional operator, 24
  - data type declaration, 16
- color(s)
  - background, 290, 305
  - blend modes, 252–253
  - borders, 306
  - complementary, 536
  - convolution filter, 542
  - displacement filter, 544
  - drop shadow filter, 529
  - fonts, 309
  - glow filter, 532
  - gradient bevel filter, 533
  - line gradient, 560
  - lines, 550
  - motion XML, 593–594
  - palette, remapping, 644–645
  - and printing, 290
  - TextFormat, 309
  - transforms. *See* color transformations
  - and transition effects, 639–641
- color transformations, 536–542, 610–614, 635–646
  - application, example of, 612–614
  - brightness, 540
  - color palette remapping, 644–645
  - ColorMatrixFilter, 535–541
  - ColorTransform, 535, 593–594, 610–614, 620, 635–636
  - contrast, 541

## C

## Index

- detect areas by color, 637–639
- digital negative, 536–537
- display object, applying color transforms, 610
- fills, 636–637
- grayscale, 537
- pixel dissolves, 641–644
- replacing colors, threshold ( ), 639–641
- reset colors, 612
- retrieving/setting color, 610–611
- saturation changes, 538–539
- tint, 539–540, 611–612
- comments, 31–33
  - block comments, 32
  - comment out line of code, 33
  - self-commenting code, 33
  - single line comments, 32
  - situations for use, 32–33
  - TODO, 32
  - XML, 208
  - XML comments, 32
- compile code
  - Non-Strict mode, 113
  - Strict mode, 113
  - warnings, 114
- compile-time errors
  - causes of, 114
  - Compiler Errors, errors displayed in, 115
  - correcting errors, 117
  - error markers, 117
- complete, uploading, 479
- componentX and componentY, displacement
  - filter, 543
- composition
  - EventDispatcher, use by, 340
  - functions of, 54–56
  - versus inheritance, 54–56
- compound assignment operators, types of, 19
- computeSpectrum ( ), 497–498, 659–660
- concatenation
  - combining strings, 127
  - concat ( ), 127, 157–158, 606–607
  - matrix transformations, 606–607
  - values, appending to end of array, 157–159
- conditional(s), 19–25
  - assignment within, C1100 error, 119
  - Boolean values, use of, 22
  - break, 23
  - conditional operator, 24–25
  - curly brackets with, 20
  - function of, 19
  - if, 20–22
  - if...else, 23
  - parentheses with, 29
  - switch, 23–24
- conditional operator (?:)
  - functions of, 24
  - uses of, 24–25
- conditional processing, arrays, 166–168
- connect ( )
  - binary socket connection, 665–666
  - receiving application, creating, 689
- connect method, NetConnection, 449, 507
- Console view, errors displayed in, 117
- constants
  - caps and underscores in, 9
  - const keyword, 8–9
  - defined, 69
  - functions of, 8–9
  - static constants, 79–81

- constructors
    - Array constructor, 153–155
    - BitmapData, creating, 616
    - byte arrays, 657
    - declaring, 68
    - default constructor, 76
    - example of, 69
    - functions of, 68–69
    - objects, creating, 174
    - parentheses with, 69
    - and public attribute, 68–69, 83
    - return type, blank, 104
    - sound, 488
    - super keyword, actions of, 107
    - SWFObject, 674
  - contentLoaderInfo, 437
  - continue
    - with loops, 31
    - suspended program, 405
  - contrast effects, 541
  - convolution filter, 542–543
    - edge detection, 542
    - emboss, 543
    - sharpen, 542
  - cookies, storage through, 456
  - copying
    - and byte arrays, 661–662
    - channels, BitmapData, 626, 628–632
    - copySource, 639
    - display objects, copying images from, 619–624
    - objects, 661–662
    - pixels, BitmapData, 626, 628–630
    - XML object, 198
  - cosine of angle, method call, 144
  - createGradientBox (), 561
  - creationDate, FileReference, 476
  - creator, FileReference, 476
  - cross-domain policy file, img tag, 304
  - CSS styles, 305
  - ctrlKey
    - Boolean property, MouseEvent, 356–357
    - event, 364
  - cue points, video, 502
  - curly brackets ( { } )
    - with ActionScript, embedded in XML, 185
    - with conditionals, 20
    - generic objects, 9
    - with methods, 67
  - currentCount, 369, 371
  - currentTarget, 349
  - curves
    - drawing, 555
    - drawing in graphics object, 255
  - curveTo (), 555
  - custom classes, storing, 467–469
  - CustomEase tween, 595–596
  - custom namespaces, features of, 66–67
- ## D
- Darken BlendMode, 253
  - data, URLLoader, 431
  - dataFormat, 431
  - data structures
    - map, 168
    - queues, 159–160
    - stack, 158–159
  - data types
    - colon (:) with, 16
    - declaring, 16–17
    - functions of, 16–17

## D Index

- as parent class, 17
  - passing by reference, 99–100
  - passing by value, 99–100
  - void, 105
  - wildcard (\*), 17, 105
- date and time, 145–153
  - accessing/modifying date, 148–149
  - accessing/modifying time, 149
  - date arithmetic, 150
  - date, creating, 146–147
  - epoch time, 147–148
  - execution time, 150
  - formatting date, 150–151
  - strings, parsing date, 146–147
  - time zones, 148
  - zero-indexed units, 146
- Debug Flash Player, 114, 385–386
- debugging, 393–412
  - ActionScript 3.0 new features, 113
  - and AVM2, 393–394
  - breakpoint, halting at, 401–402
  - and browser, 398
  - call stack in, 405–407, 411
  - continue program, 405
  - example of, 408–410
  - Flash CS3, 395–396
  - with Flex Builder. *See* Flex Builder 2 debugger
  - halting execution, 402
  - launching debugger, 394–398
  - logging a value, 402
  - requirements for, 394
  - Step Out, 408
  - Step Over, 407–408
  - Step Return, 408
  - stepping through code, 407
  - uncaught exceptions, halting at, 399–400
  - Variables panel information, 402–404, 411
- decimal digit characters, character class, 224
- decode, URLVariables, 435
- decrement (—) operator, functions of, 19
- default behaviors
  - events, preventing, 349
  - focus, changing, 359–360
  - overriding, 349
- default constructor, 76
- default keyword, recommended use, 24
- default package, features of, 45
- defaultSettings (), 209
- default values
  - arguments, setting, 100–101
  - setting, with conditional operator, 25
- delay, timers, 368, 371
- deleting
  - delete operator, 179
  - properties, 179
  - SharedObject, 459
- delta property, MouseEvent, 356
- descendants, XML
  - accessing, 190–191
  - descendant access operator, 190–191
- descending order, sorting, 165
- descent, TextMetrics, 322
- description, FileFilter, 474
- deserialization
  - custom classes, storing, 469–471
  - defined, 467
- destChannel, 631
- destPoint, 628, 631, 632, 639, 641, 644, 652
- device fonts, printing issue, 290
- dictionary
  - alternatives to, 170

- array, 169–170, 176
- code, example of, 170
- syntax, 177
- Difference BlendMode, 253
- digital negative effect, 536–537
- Digital Rights Management (DRM)
  - and Flash Media Server, 502
  - FLV file over HTTP, 504
- dispatcher
  - events, 334
  - See also* EventDispatcher
- dispatchEvent ( ), 344
- displacement filter, 543–544
- DisplacementMapFilter, 652–653
- display list, 243–275
  - ActionScript 3.0 new features, 243–249
  - bouncing ball, creating, 271–273
  - collision of clips, checking for, 273–275
  - display objects, creating, 245–246
  - DisplayObject as core. *See* DisplayObject
  - graphics, embedding, 282–283
  - graphics object, 254–255
  - hierarchy of, 244
  - item renderer, creating, 270–271
  - symbols, 277–281
- DisplayObject, 244–253
  - blend modes, 252–253
  - DisplayObjectContainer, 245–250
  - filters, 525–527
  - functions of, 247–249
  - InteractiveObject, 257–261
  - Loader object, 436–439
  - MovieClip, 268–269
  - Shape, 261–262
  - sizing, 252
- Sprite, 262–268
- Stage, 246–247, 255–257
- transform, 252
- x and y position of, 250
- DisplayObjectContainer, 245–250
  - with DisplayObjects, 245–250
  - functions of, 250
  - sub-classes of, 248
- display types
  - ActionScript 3.0 new features, 4–5
  - and polymorphism, 5
- DispleasingNumberError, 385
- dissolve, pixel dissolves, 641–644
- distance
  - bevel filters, 530
  - drop shadow filter, 528
  - gradient bevel filter, 533
- distortion effects, displacement filter, 543–544
- division operator (/), 18, 142
- divisor, convolution filter, 542
- do..while, functions of, 30
- document class, recommended use, 4
- dollar sign (\$), as anchor, 227
- domain names, choosing, 42
- dot (.) operator
  - object properties, accessing, 174–175
  - in regular expressions, 221, 231
- dot (.) operator, XML
  - E4X, accessing elements with, 187–188
  - functions of, 185
- dot (.) syntax, to call function, 97
- dotall: Boolean, 239
- dotall flag (s), regular expressions, 231
- double-click, mouse, 260, 357
- doubleClickEnabled, 357

**D** Index

double colon (: :), nodes with namespaces,  
accessing, 207

double dot (..), descendant access operator,  
190–191

double-precision floating-point numbers, 136–137  
Number type, 137

downloading files  
default file name, 482  
URLRequest, 482

drag and drop, Sprite, 262–264

draw (), BitmapData, 626–628

drawCircle, 254

drawEllipse, 254

drawing, 549–580  
bitmap fill, 556–559  
clearing graphics, 564  
drawing application, example of, 572–580  
gradients, 560–564  
lines/line styles, 549–564  
masks, 569–572  
MouseEvent for, 579  
moving pen, 553–554  
shapes, 564–569  
solid color fill, 555–556

drawRect, 254

drawRoundRect, 254

drop shadow filter, 528–530

duplicateDisplayObject (), 544

dynamic classes, 173–174  
creating, 94, 174  
functions of, 94  
Object class, 94

dynamic expressions, from regular expressions, 238

dynamically typed code, functions of, 39

**E**

## E4X

ActionScript 3.0 new feature, 6

ancestors, accessing, 191–192

attributes, accessing with @ operator, 189

children, accessing with methods, 188–189

descendant accessor operator, 190–191

elements, accessing with dot operator, 187–188

iteration, 192

and motion XML, 598

named groups, 236–237

operators, 185

origin of, 184

parentheses filter operator (), 192–193

syntax, 185

text in elements, accessing, 190

easing  
animation, 588  
iTween objects, 595–597

ECMAScript for XML. *See* E4X

edge detection, 542

elements, XML, accessing, 187–188

ellipses  
drawing, 566  
ellipseHeight, rounded rectangles, 567  
ellipseWidth, rounded rectangles, 567

else, if..else, 23

embedded assets  
BitmapData, creating, 616–617  
in Flash authoring, 617  
in Flex Builder, 616

embedding  
embed tag, 282, 490, 616  
Flash in web page, 671–674  
fonts, 313

- graphics, 282–283
- images, 303
- sound files, 489–490
- SWF files, 304–305
- XML, 184–185
- emboss effects, 543
- empty string, and arrays, 157
- empty tags, XML, removing, 201
- empty values, types of, 9
- encapsulation, 39–41
  - and access control, 61
  - defined, 39
  - and polymorphism, 40–41
- encodings, URL, 428–429
- end ( ), Animation class, 597
- endFill ( ), 254, 555–556
- Enter, newline character, 124
- enterFrame, 583, 585–586
- enumerations
  - building, 81
  - as final classes, 81
- epoch time, 147–148
- equal sign (=)
  - arguments, setting default values, 100–101
  - equality operator, 20
  - operator as logical comparison operator (==), 20
- equality, if statement, 20
- Erase BlendMode, 253
- error(s), 113–120, 379–392
  - asynchronous, 390–392
  - benefits of, 16
  - C1100, 119
  - causes/solutions, 119–120
  - compile-time errors, 114
  - correcting, 117–118
  - defined, 113
  - during downcasting, 388
  - equal sign, double versus single, 20
  - exceptions, 380–390
  - failing silently, 380
  - in Flash CS3 Professional, 115–116
  - in Flex Builder, 116–117
  - 1036, 120
  - 1046, 119
  - 1067, 120
  - runtime. *See* runtime errors
  - severity message, 418
  - T1119, 119
  - T1120, 119
  - T1180, 119
  - Type Coercion Error, 158
  - TypeError: Error#1009, 118
  - and uploading, 479
  - See also* debugging; error handling; exceptions
- error handling, 413–422
  - common errors for, 414–415
  - error categorization, 415–416
  - error logs, 416–418
  - example of, 419–422
  - messaging user, 418–419
- error logs, 416–418
  - error severities, 418
  - methods, 416–417
- escape characters
  - backslash with, 124, 221–222
  - functions of, 124, 221
  - listing of, 124–125, 222
  - with regular expressions, 221–222
  - with strings, 124–125
- EvalError, 388

## E Index

- event(s), 331–349
  - default behaviors, preventing, 349
  - defined, 331, 334
  - dispatcher/listener relationship, 332–334
  - event handling arguments, 337
  - event listeners, 332, 342–344
  - event target, 331
  - event type, 331
  - EventDispatcher, 332, 335–340
  - flow. *See* event flow
  - focus, 259–260
  - of InteractiveObject, 260–261
  - keyboard, 260–261
  - and method closures, 5
  - mouse, 260–261, 261
  - new, creating, 341–342
  - operation, example of, 332–334
  - terminology related to, 334–335
- EventDispatcher, 335–340
  - composition, use by, 340
  - defined, 332
  - dispatchEvent (), 335–336
  - listeners, creating, 336–337
  - main application class, creating, 337–339
  - URLLoader, 429–436
  - use, example of, 335–339
- event flow, 344–349
  - bubble phase, 345–346
  - capture phase, 344
  - operation, example of, 346–349
  - target phase, 344–345
- event listeners, 342–344
  - adding, 342–343
  - creating, 336–337
  - defined, 332, 342
  - handler function as, 342
  - message from server, 666
  - removing, 343
- every (), arrays, conditional processing, 166–167
- exceptions, 380–387
  - ArgumentError, 384, 389
  - catching, 381–383
  - defined, 380–381
  - Error type, 388
  - EvalError, 388
  - exception flow, 383–385
  - fault tolerance. *See* error handling
  - finally, use of, 386–387
  - flash.error.EOFError, 389
  - flash.error.IllegalOperationError, 389
  - flash.error.IOError, 389
  - flash.error.MemoryError, 390
  - flash.error.ScriptTimeoutError, 390
  - flash.error.StackOverflowError, 390
  - RangeError, 389
  - ReferenceError, 389
  - rethrowing, 387
  - SecurityError, 389
  - SyntaxError, 389
  - throwing, 381, 388
  - TypeError, 389
  - uncaught, 385–386
  - uncaught, halting at, 399–400
  - URIError, 389
  - VerifyError, 389
- exclamation mark (!), not operator, 21
- exec (), 214–218
- execution time, 150
- explicit accessors
  - example of, 70–72
  - purpose of, 70

explicit type conversion, 91–93  
 exponential notation  
   entering in code, 139  
   purpose of, 139  
 Express Install, 678–679  
 Expressions view, Flex Builder 2 debugger, 404  
 extended: Boolean, 239  
 extended flag (x), regular expressions, 231–232  
 extensions, FileFilter, 474  
 external data  
   Loader object, 436–439  
   opening HTML page. *See* URL  
   security, 439–441  
 ExternalInterface, 681–686  
 extract  
   with regular expressions, 216–217  
   subset of array, 160–161  
   values from arguments, 102

## F

factorial, recursive functions, 109–110  
 failing silently, 380  
 failure of program. *See* errors; exceptions  
 false, Boolean value, 9, 19  
 fast-forward, sound, 491–492  
 fatal, error severity, 418  
 fault tolerance. *See* error handling  
 favorArea, 516  
 FFTMode, 498  
 Filedata, 479  
 file extensions, .as files for classes, 37  
 FileFilter, parameters, 474  
 FileReference, 473, 475–479  
 FileReferenceList, 475–478  
 fills  
   bitmap fills, 556–559  
   creating, 254  
   fillColor, 641  
   flood fills, 636–637  
   gradient fills, 563–564  
   rectangular fills, 636  
   shapes, 568–569  
   solid color fills, 555–556  
 filter(s), 525–547  
   applying, situations for, 526–527  
   bevel filters, 530–531  
   BitmapData objects, 652–653  
   blur filters, 527–528  
   color transformations, 536–542  
   convolution filter, 542–543  
   displacement filter, 543–544  
   drop shadow filter, 528–530  
   glow filter, 532  
   gradient bevel filter, 533–534  
   gradient glow filter, 543  
   motion XML, 594–595  
   multiple, applying, 544–545  
   rotation with, 546–547  
   XML filter operator ( ), 192–193  
 filter ( ) method, arrays, conditional  
   processing, 168  
 final class  
   declaring, 57–58  
   enumeration as, 81  
 final keyword, override not available, 108  
 finally block, error handling, 386–387, 416  
 findColor, 637  
 FireBug, external error log, 417  
 first in/first out (FIFO), queues, 159–160  
 first in/last out (FILO), stacks, 158–159  
 flags  
   case-insensitivity flag (i), 214

- regular expressions, 229–232
- sort flags, 165
- Flash CS3 Professional
  - and ActionScript, 4
  - Debug version, 114
  - source directory, 43
- flash.error.EOFError, 389
- flash.error.IllegalOperationError, 389
- flash.error.IOError, 389
- flash.error.MemoryError, 390
- flash.error.ScriptTimeoutError, 390
- flash.error.StackOverflowError, 390
- flash.events.EventDispatcher, as base class, 6
- Flash Media Server
  - benefits to use, 502–503
  - drawbacks of, 503
  - functions of, 521
  - RTMP protocol, 502–503
- Flash motion package
  - Animator class methods, 597–598
  - limitations of, 599
  - MatrixTransformer, 598
  - for motion XML, 597–598
  - MotionEvent events, 598
- Flash movie files. *See* SWF files
- FlashPaper, printing, 287
- Flash Player, Express Install, 678–679
- Flash Remoting, 448–452
  - AMFPHP example, 450–452
  - NetConnection, 448–449, 452
  - Remoting Gateway, 448
  - Responder, 449–450
- Flash Video Encoder
  - directory for, 501
  - video, encoding, 502
- flash.xml package, 187
- Flex Builder 2
  - and ActionScript, 4
  - animation, 599
  - automatic build, 116
  - embedded assets, 616
  - errors/warnings display in, 116–117
  - graphics, embedding, 282–283
  - namespaces, use of, 65
- Flex Builder 2 debugger
  - benefits of, 398
  - breakpoint, setting, 401–402
  - call stack, 406–407
  - execution, halting, 402
  - Expressions view, 404
  - Resume execution, 405
  - starting/stopping, 396–398
  - Step Return, 408
  - Variables panel, 404
- floating-point numbers, 136
  - conversion to integers, 140–141
  - double-precision, 136
  - parts of, 136
- flood fills, applying, 636–637
- flow, events. *See* event flow
- flush ( )
  - servers, send messages to, 666
  - SharedObject, 459–460, 465–467
- FLV files. *See* video
- focalPointRatio, line gradient, 561
- focus
  - changing, 359–360
  - functions of, 258
- FocusEvent, mouseFocusChange, 359–360
- focusIn
  - InteractiveObject, 258
  - TextField, 325–326

- focusOut
  - InteractiveObject, 259
  - TextField, 325–326
- folders, packages in, 43
- fonts
  - antialiasing, 314–315
  - colors, 309
  - embedded, 313
  - HTML tag, 303
  - measure, TextMetrics, 322
  - TextFormat, 309
- for, 26–28
  - for each..in, 28
  - for..in loops, 27–28
  - item in array, accessing, 161
  - parts of, 25
  - versus while loops, 30
- forEach ( ), 162
- for each..in
  - functions of, 28
  - key-value pairs, 179
  - XMLList, iterate through, 192
- for.. in loops
  - functions of, 27–28
  - key-value pairs, 179
  - XMLList, iterate through, 192
- foreign languages
  - IMEEvent, 365
  - regular expressions, 237
- form feed, escape character, 124, 222
- forward slash (/), division operator, 18
- forward slash asterisk (/ \*), block comments, 32
- forward slashes (//)
  - regular expressions, 9, 222
  - single line comments, 32
- fractalNoise, 648
- frame rate
  - animation, 581–582, 585–586
  - default rate, 582
  - MovieClip, 268
- framesLoaded, MovieClip, 269
- full-screen Flash, 675–676
- function(s)
  - arguments, adding to, 96
  - calling, 96–97
  - compared to methods, 96
  - defining, 97–98
  - expressions, situations for use, 106
  - naming, 97–98
  - nested functions, 13
  - as objects, 110–111
  - parentheses in calls, 97
  - passing parameters to, 98–102
  - purpose of, 95, 103
  - recursive functions, 108–110
  - rest parameter (...) in, 101–102
  - return statement, 103–105
  - return type, defining, 104–105
  - scope, 11–16
  - for sorting data, 164–166
  - statements, parts of, 97–98
  - statements versus expressions, 106
  - sub-procedures, 105
  - variables defined within, 12–13
- function body, 98
- Function class
  - example of use, 110–111
  - versus functions, 110
  - inheritance from Object class, 111
  - methods/properties of, 111

FunctionEase tween, 596  
 function keyword, in function statements, 97  
 functionality  
   composition, 54–56, 63  
   inheritance, 47–58, 63  
   and methods, 96  
   printing, 292–296

## G

generic objects, 9  
   curly brackets with, 9  
 GET  
   security issue, 427  
   URL encoding, 428–429  
   URLLoader, 434  
   URLRequest, 427–429  
 getCamera, 515  
 getCharCode ( ), 363  
 getCharIndexAtPoint, 302, 321  
 getChildAt (index:int), 248  
 getChildByName (name:string), 248  
 getColorBoundsRect ( ), 637–638  
 getFirstCharInParagraph, 302  
 getCharCode ( ), 363  
 getLineIndexOfChar, 315  
 getLineOffset, 316  
 getMicrophone, 518  
 getPixel ( ), 626, 634–635  
 getTag, 233  
 getTimer ( ), 150, 375, 586  
 gettingMasked, 569  
 .gif, 282  
 global: Boolean, 239  
 global flag (g), regular expressions, 217, 229  
 global scope, defined, 11  
 Global Storage Settings, 463–464  
 globalToLocal, 250, 356  
 glow filter, 532  
 gotoAndPlay ( ), MovieClip, 268–269  
 gradient(s), 560–564  
   bevel filter, 533–534  
   fills, 563–564  
   glow filter, 543  
   lines, 560–563  
 grain, noise, 646–653  
 graphics  
   bitmap, importing, 282  
   embed tag, 282  
   embedded, utilizing, 283  
   file extensions, 282  
   transforms. *See* transformations  
 graphics object, 254–255  
   curves, drawing, 255  
   fills, 254  
   lines, drawing, 254–255  
   Shape, 261–262  
 grayscale  
   effect, applying, 537  
   noise, 646, 649  
 greater than (>), 21  
 greater than or equal to (>=), 21  
 greedy matching, regular expressions, 232–233  
 greenArray, 644  
 greenMultiplier, 632  
 grid fitting, 315  
 grouping  
   capturing groups, 217  
   named groups, 236–237  
   negative lookahead groups, 235  
   non-capturing groups, 234

- parentheses with, 228
- positive lookahead groups, 235
- regular expressions, 228

## H

- hand, from pointer changes, 264
- handler, events, 334
- Hardlight BlendMode, 253
- hasAudio, 500
- hasBackground, 305
- hasComplexContent ( ), 204
- hash/hashtable. *See* associative arrays
- hasSimpleContent ( ), 204
- hasStreamingAudio, 500
- height
  - BitmapData, 619
  - ellipses, 566
  - img tag, 304
  - rectangles, 565
  - rounded rectangles, 567
  - TextMetrics, 321
- hexadecimal
  - entering in code, 139
  - programming, reasons for use, 134
- hideObject
- hideObject, drop shadow filter, 529
- hierarchy, and packages, 42–43
- high, noise, 646
- highlightAlpha, bevel filters, 530
- highlightColor, bevel filters, 530
- hitArea, 264–265
- hitTest, 273
- hitTestPoint, 265
- horizontal space, img tag, 304
- hspace, img tag, 304

## HTML

- display in TextField, 303–304
- link events, 326–327
- tags/actions in Flash, 303–304
- See also* web pages

## HTTP

- FLV file, building connection to, 506–507
- FLV files, accessing with HTTP, 503–504
- httpStatus, uploading, 479
- socket connection activities, 665
- hypertext link, HTML tag, 303
- HyperText Transfer Protocol. *See* HTTP

## I

- IBitmapDrawable, 249
- id, img tag, 304
- ID3 tag, sound, 496–497
- IDataOutput, 666
- IExternalizable, 469–471, 664
- if statement, 20–22
  - And/Or operators, 21–22
  - for equality, 20
  - functions of, 20
  - greater than/less than, 21
  - if..else, 23
  - not equal to (!=), 21
  - null values, checking for, 22
- if...else statement, functions of, 23
- ignoreCase: Boolean, 239
- ignore case flag (i), regular expressions, 229
- ignoreComments, 204, 209
- ignoreProcessingInstructions, 204, 209
- ignoreWhitespace, 209
- images
  - embedding, HTML tag, 303

## I Index

- img tag, properties of, 304–305
  - See also* graphics
- IMEEvent, 365
- implicit accessors
  - example of, 72–73
  - purpose of, 72
- implicit type conversion, 90–91
- import
  - bitmap graphics, 282
  - code from packages, 44–45
  - compared to # include, 45
  - namespaces, 66
  - position of statement, 45
  - wildcard (\*) with, 45–46
- in operator, properties, checking for existence of, 178
- # include
  - ActionScript 3.0, not supported, 45
  - compared to import, 45
- increment (++) operator, functions of, 19
- indentation
  - block indent, 308
  - prettyIndent, XML, 201–202, 209
  - ten pixels example, 309–310
  - TextFormat, 308, 309–310
- indexes
  - byte arrays, 658
  - Keyframe, motion XML, 593
  - in strings, 128, 130
- indexOf ( ), 130, 162–163
- infinite loops
  - avoiding, 30, 109–110
  - cause of, 109
- infinity, 140
- info, error severity, 418
- information hiding, encapsulation, 40–42
- inheritance, 47–58
  - classes, extending with, 62
  - code, structuring for, 51–52
  - versus composition, 54–56
  - example of, 48–49
  - functions of, 47–48, 52, 107
  - inheritance chain, 51
  - multiple as problem, 84
  - to override parent class, 49–50
  - and polymorphism, 52–54
  - preventing, 57–58
  - See also* subclass; superclass
- inner
  - drop shadow filter, 529
  - glow filter, 532
- Input Method Editors (IME), IMEEvent, 365
- inScopeNamespaces ( ), 206
- instance(s)
  - functions of, 38, 76–77
  - and methods, 96
  - in object-oriented programming, 38–39
  - and objects, 39
- instance variables
  - accessing, 12
  - example of, 76–77
  - functions of, 76
  - memory management tip, 12
  - parts of, 69
  - properties, 69–73
  - this keyword with, 15
  - use, determining, 16
- int type, functions of, 137
- integers
  - signed, 135–136
  - unsigned, 135

InteractiveObject, 257–261  
 events, 260–261  
 focus, 258–260  
 and KeyboardEvent, 362–363  
 mouse properties, 260  
 and MouseEvent, 351–355  
 SimpleButton, 257–258  
 tab-enabled objects, 258

interface  
 black box principle, 40  
 classes, use of, 85–89  
 implementing with classes, 83–89  
 multiple, implementation of, 89  
 names, 89  
 necessity of, 40, 84–85, 89  
 public attribute, 61  
 Sprite, 262–268

internal, 63–64  
 example of, 63–64  
 functions of, 10, 63  
 and packages, 63–64

interpolateColor, 598

interpolationMethod, line gradient, 561

intrinsic event model, ActionScript 3.0 new  
 feature, 6

Invert BlendMode, 253

ioError, uploading, 479

IOErrorEvent, 479

irrational numbers, 134

is operator  
 ActionScript 3.0 new features, 93  
 types, determining compatibility, 93

italics  
 HTML tag, 303  
 TextFormat, 310

item renderer, creating, 270–271

iteration  
 arrays, 161–162  
 key-value pairs, 179  
 for loops, 26–27, 161  
 XML, 192

iTween, motion XML, 590, 595–597

## J

JavaScript and Flash, 681–686  
 browsers supported, 681  
 ExternalInterface, 681–686  
 function calls, 682–683  
 HTML/Flash application, example of, 683–686

join (), 157

joint styles, lines, 550, 553

.jpeg, 282

JSON parser, nested data storage, 181

justified text  
 TextField, 300–301  
 TextFormat, 307

## K

key(s), objects used as, 176–177

keyboard  
 events, 260–261  
 moving Sprite on stage, example of, 364–365  
*See also* KeyboardEvent

KeyboardEvent, 362–365  
 charCode, 363–364  
 ctrlKey, 364  
 functions of, 362–363  
 and InteractiveObject, 362–363  
 keyCode, 363–364  
 keyDown, 261, 363

**K** Index

- keyFocusChange, 261, 364
  - keyLocation, 364
  - keyUp, 261, 363
  - shiftKey, 364
  - keyframes
    - animation, 588–589
    - Keyframe object, motion XML, 592–593
  - Key listener, characters, converting to ASCII
    - code, 129
  - key-value pairs
    - associative arrays, 175, 177–179
    - checking for existence of, 178
    - deleting, 179
    - dictionary storage of, 176
    - iteration, 179
  - knockout
    - bevel filters, 531
    - drop shadow filter, 529
    - glow filter, 532
    - gradient bevel filter, 534
- L**
- label, Keyframe, motion XML, 593
  - landscape printing, 288
  - lastIndex: Number, 239
  - lastIndexOf, 130, 162
  - Layer BlendMode, 253
  - lazy matching, regular expressions, 232–233
  - leading
    - TextFormat, 310
    - TextMetrics, 322
  - leftMargin, TextFormat, 310–311, 311
  - length property, arrays, 25, 155, 156
  - less than (<), 21
  - less than or equal to (<=), 21
  - lexers, purpose of, 211
  - Library, sound, exporting to, 489
  - licensing, Flash Media Server, 503
  - Lighten BlendMode, 253
  - line(s), 549–564
    - curves, 555
    - drawing in graphics object, 254–255
    - end caps, 552–553
    - gradient applied, 560–563
    - join styles, 550, 553
    - line style, changing, 551
    - miter limit, 550, 553
    - number of, TextField, 315–317
    - pixel snapping, 550, 551
    - scaling, 550–552
    - straight, 554
    - thickness, 550
  - line break, HTML tag, 303
  - lineGradientStyle ( ), 560–563
  - lineTo ( ), 554
  - linear equations, matrix, 603–604
  - link events, TextField, 326–327
  - listener. *See* event listeners
  - literals, 138–139
    - ActionScript 3.0 new literals, 9
    - array literals, 155
    - avoiding in code, 9
    - entering in code, 138
    - exponential notation, 139
    - functions of, 9
    - XML, 9, 184–185
  - load ( ), URLLoader, 431
  - Loader, 436–439
    - BitmapData images, 624–626
    - event listeners, 437

- loaderContent, 443
- loading images, byte arrays for, 660–661
- security measures, 440–441
- SWF file, loading, 437–439
- unload, 437
- LocalConnection, 687–691
  - receiving application, 689
  - send/receive across domains, 690–691
  - sending application, 687–689
- local with file, security sandbox, 440
- localName ( ), 207
- local with network, security sandbox, 440
- local path parameter, 461
- local scope, 11–13
  - block-level variables, 13
  - function-level variables/functions, 12–13
  - instance variables/methods, 12
  - static variables/methods, 11–12
- local shared objects
  - storage, 455–457
  - See also* SharedObject
- localToGlobal, 250
- local trusted, security sandbox, 440
- localX/localY, 355–356
- logging
  - errors. *See* error logs
  - value, and debugging, 402
- logical expressions. *See* conditional(s)
- loops, 25–31
  - and arrays, 26–27
  - break, 31
  - continue, 31
  - functions of, 25
  - infinite, avoiding, 30
  - for loops, 26–28

- sound files, 491
  - uses of, 25
  - while loops, 29–30
- low, noise, 646
- luminance of color, calculating, 537

## M

- macType, FileFilter, 474
- map ( ), new array, 168–169
- mapBitmap, displacement filter, 543
- mapPoint, displacement filter, 543
- margins
  - TextField, 300–301
  - TextFormat, 310–311
- mask(s), 569–572
  - advanced example, 570–572
  - applying, example of, 569–570
  - areas, detecting by color, 637
  - functions of, 569
  - threshold ( ), 639
- maskingSprite, 569–572
- match ( ), 216–217
- Math class arithmetic, operators, 143
- mathematical functions. *See* operators
- matrix
  - draw ( ), 620
  - line gradient, 560
  - linear equations for, 603–604
  - multiplication, 535, 606
  - See also* matrix transformations
- matrix transformations, 603–610
  - ColorMatrixFilter, 535–536
  - concatenation, 606–607
  - cumulative, 605–606
  - and display object properties, 605

## M

## Index

- identity matrix, 604
- Matrix class properties, 604–605
- MatrixTransformer, 598
- multiple, applying, 606–607
- rectangles, transforming, example of, 607–610
- rotation, 605–606
- scaling, 604–605
- shear, 605
- translation, 605
- matrixX and matrixY, convolution filter, 542
- media servers
  - Flash Media Server, 521
  - Red5, 521
  - streaming data to, 521–522
- memory
  - instance variables stored in, 12
  - management, useWeakReference, 343
  - MemoryError, 390
- mergeAlpha, 629
- merging images, BitmapData, 626, 632–634
- metacharacters/metasequence, regular expressions, 222–223
- metadata, FLV files, 508–509
- method(s)
  - checking for existence of, 178
  - in classes, 67–69
  - compared to functions, 96
  - constructors, 68–69
  - declaring, 68
  - dot syntax, 97
  - flash.error.IllegalOperationError, 389
  - of Function class, 111
  - functions of, 67, 96
  - in namespaces, 66–67
  - overloading methods, 75
  - overriding, 73–75
  - parts of, 68
  - static methods, 81–83
  - verbs as, 68
- method closures
  - ActionScript 3.0 new feature, 5–6, 96
  - defined, 96
- method signature, defined, 96
- microphone, 518–520
  - activity detection, 518
  - getting reference/listening, example of, 519–520
  - and media servers, 521–522
  - object, creating, 518
  - silence level, 518
- minDiskSpace, 465–466
- minus (-), decrement operator, 19, 143
- miter limit, lines, 553
- mode, displacement filter, 543
- Model-View-Controller, 56
- modificationDate, FileReference, 476
- modulo operator (%), 18, 142
- motionEnd, 598
- MotionEvent, events of, 598
- motion level, camera, 516
- motionStart, 598
- motionUpdate, 598
- motion XML, 588–598
  - Bezier curves, 595–597
  - capabilities of, 587
  - Color object, 593–594
  - and E4X, 598
  - filters, 594–595
  - and Flash motion package, 597–598
  - iTween object, 590, 595–597
  - Keyframe object, 592–593

- Motion object, 590–591
- object nodes, 589–590
- property nodes, 589–590
- rotation, 591–593
- scaling, 591–593
- skewing, 591–593
- Source object, 591–592
- structure of, 588–590
- tags, functions of, 588
- transformations, 591–592
- mouse
  - double-click, 260, 261
  - drawing application, 579
  - enabling, 260
  - events, 260–261
  - InteractiveObject actions, 260
  - pointer, changing, examples of, 264, 360–362
  - scroll, 318
  - See also* MouseEvent
- MouseEvent, 351–362
  - click, 260, 357
  - ctrlKey Boolean property, 356–357
  - delta property, 356
  - double click, 260, 357
  - and InteractiveObject, 351–355
  - listening for, 353–355
  - and local coordinates, 355–356
  - mouseDown, 261, 264, 353–355, 358
  - mouseFocusChange, 261, 359–360
  - mouseMove, 261, 358
  - mouseOut, 261, 353, 358
  - mouseOver, 261, 358
  - mouseUp, 261, 358
  - mouseWheel, 261, 358
  - operation, example of, 351–355
  - relatedObject property, 357
  - rollOut, 261, 359
  - rollOver, 261, 359
  - and stage coordinates, 355–356
- moveTo ( ), 553–554
- movie(s), ActionScript 3.0 new features, 243
- MovieClip, 268–269
  - frame, printing, 289
  - frame rate, 268
  - framesLoaded, 269
  - gotoAndPlay ( ), 268–269
  - onEnterFrame, 268, 271
  - stop, 268–269
  - totalFrames, 269
- MP3 sound files, loading, 488, 496
- multidimensional arrays, code, example of, 170–171
- multiline: Boolean, 239
- multiline flag (m), 226
  - regular expressions, 230
- multiline mode, TextField, 319–322
- multiplication operator (\*), 18, 142
- Multiply BlendMode, 253
- mute, microphone, 518

## N

- name, FileReference, 476
- name-value pairs, URLVariables, 434–435
- named groups, regular expressions, 236–237
- namespaces, 64–67, 205–206
  - as access control modifiers, 64–66
  - ActionScript 3.0 new features, 64
  - creating with packages, 42
  - custom, features of, 66–67
  - defined, 42, 64

- double colon (: :), 207
- importing, 66
- inScopeNamespaces ( ) method, 206
- items, adding to, 66
- methods in, use of, 66–67
- namespace ( ), 206
- namespaceDeclarations ( ), 206
- namespace keyword, 65
- namespace URI, 205–206
- new, creating, 65–66
  - XML, 186–187, 205–207
- navigateToURL, 427
- negative lookahead groups, regular
  - expressions, 235
- negative numbers,
  - operator, 142
  - signed integers, 135–136
- nested data, objects as, 180–181
- nested functions, actions of, 13
- NetConnection
  - and Flash Remoting, 448–449, 452
  - HTTP connection to FLV file, 506–507
  - methods, 448–449
  - object, constructing, 506–507
- NetStream, 505–509
  - class properties, 505–506
  - displaying video, 507
  - methods, 506
  - status messages, 507
- networks, flash.error.IOError, 389
- newline
  - dotall flag matching, 221
  - escape character for, 124, 222
- nextFrame ( ), Animation class, 597
- node(s), XML. *See* XML
- nodeKind ( ), 203
- noise, 646–653
  - adding, 646–648
  - Perlin noise, 648–651
  - random, example of, 646–648
- non-capturing groups, regular expressions, 234
- Non-Strict mode, 113
- Normal BlendMode, 253
- normalize ( ), XML text nodes, 202
- not equal to (!=), 21
- notnull, 400
- not a number (NaN), 139–140
- not operator (!), 21
- null, 9
  - and debugging, 400
  - TextFormat, 307
  - values, checking for, 22
- number(s), 133–142
  - ActionScript 3.0 new features, 137–138
  - character class, 224
  - conversions. *See* numeric conversions
  - exponential notation, 139
  - floating-point numbers, 136
  - hexadecimal (base 16), 134
  - infinity, 140
  - int type, 137
  - literals, 138–139
  - minimum/maximum values, 140
  - natural, 133
  - not a number (NaN), 139–140
  - Number type, 137
  - quantifiers, 225
  - RangeError, 389
  - rational and irrational, 134
  - representations for, 134

- set and superset, 134
- signed integers, 135–136
- uint type, 138
- unsigned integers, 135
- number of lines, TextField, 315–317
- Number type
  - functions of, 137
  - infinity, 140
  - not a number (NaN), 139–140
- numChildren, 266
- numeric conversions, 140–142
  - floating-point to integer numbers, 140–141
  - string conversions, 141–142
- numeric order, sorting, 165
- numLines, 315–316
- numOctaves, Perlin noise, 649
- numPixels, 641

## O

- object(s)
  - as associative arrays, 175–176
  - and classes, 38, 39
  - constructors, 174
  - copying, 661–662
  - creating, 174
  - Error #1009, 119
  - functions as, 110–111
  - functions of, 7, 38, 176
  - and instances, 39
  - JSON parser, 181
  - key-value pairs stored in, 176–177
  - named arguments, use as, 179–180
  - as nested data, 180–181
  - in object-oriented programming, 38
  - one-time/anonymous, use of, 180
  - properties, accessing, 174–175
  - type of, 39
  - XML as, 180
  - See also* variables
- Object class
  - as dynamic class, 94, 173–174
  - Function class inheritance of, 111
  - functions of, 38
- object encoding, NetConnection, 448–449
- object nodes, motion XML, 589–590
- object-oriented programming
  - inheritance in, 47, 52
  - Open-Closed Principle, 63
  - versus procedural programming, 36
  - terminology in, 38–39
- offsets, noise, 649
- onEnterFrame, MovieClip, 268
- onLoadComplete (), 203
- onMetaData, 508
- onStatus, 507–508
- onTimer, 584–585
- open, uploading, 479
- Open-Closed Principle, 63
- operation, threshold (), 639
- operators, 17–19
  - arguments, correct number with, 17
  - arithmetic, 18
  - binary operators, 17
  - compound assignment operators, 19
  - decrement operator, 19
  - equality, 20
  - functions of, 17
  - increment operator, 19
  - modulo operator, 18
  - order of operations, 18

## O

## Index

- parentheses ( ) to group, 18
    - trinary operators, 17
    - unary operators, 17
  - Or operator ( || ), 21–22
  - orientation, printJob, 288
  - outputArray, 497
  - output window, errors displayed in, 115–116
  - Overlay BlendMode, 253
  - overloading methods, defined, 75
  - override
    - omission, compile time error, 108
    - superclass methods, 49–50, 108
  - overState, 358
- P**
- packages, 41–47
    - code allowed in, 44
    - code used from, 44–47
    - default package, 45
    - in folders, 43
    - functions of, 41–42
      - and hierarchy, 42–43
    - import, 44–47
    - and internal attribute, 63–64
    - namespaces, creating with, 42
    - package block, 43–44
    - structured as modules, 63–64
    - and uniqueness, 41–42
    - visibility of items, control of, 43–44, 64
  - pageHeight, 288
  - pageWidth, 288
  - paletteMap ( ), 644–645
  - panning, sound, 495
  - paper, printJob options, 288
  - paperHeight, 288
  - paperWidth, 288
  - paragraph
    - indentation, 309–310
    - new, HTML tag, 303
  - parameters. *See* arguments
  - parent class. *See* superclass
  - parentheses ( )
    - with arguments, 96, 97, 98
    - with calling of functions, 97
    - with conditionals, 29
    - with constructors, 69
    - with grouping, 228
    - with operators, 18
  - parentheses filter operator ( ), XML, 192–193
  - parseFloat ( ), 141–142
  - parseInt ( ), 141–142
  - parsers/parsing
    - JSON parser, 181
    - numbers from strings, 141–142
    - purpose of, 211
  - PatheticallySmallNumberError, 385
  - pattern matching
    - arrays, 131
    - regular expressions, 130–131, 213–215
  - pause
    - NetStream, 506
    - sound, 492–494
  - PDF files. *See* Adobe Acrobat
  - percentage sign ( % ), modulo operator, 18
  - Perl noise, 648–651
    - applying, example of, 649–651
    - parameters, 648–649
  - phase, events. *See* event flow
  - PHP
    - downloading, site for, 479

- Flash Remoting, 450–452
- requirements for use, 480
- server-side communication, 444–445
- uploading files, 480–482
- pipe character (|)
  - Or operator (||), 21–22
  - regular expressions, match multiple
    - alternatives, 227
- pixel(s)
  - copying, BitmapData, 626, 628–630
  - getting/setting, BitmapData, 626, 634–635
  - pixel dissolves, 641–644
- pixel snapping
  - BitmapData, 618–619
  - line style, 550, 551
- play ()
  - Animation class, 597
  - NetStream, 506–507
  - sound files, 491–494
- plus (+)
  - increment operator, 19, 143
  - regular expression quantifier, 224
  - XML, adding data, 194
- plus equal sign (+=), XML, adding data, 194–195
- .png, 282
- pointer, to hand changes, 264
- points
  - points per inch, 288
  - TextFormat, 311
- polling, servers, 446
- polymorphism
  - defined, 41, 52–53
  - and display types, 5
  - and encapsulation, 40–41
  - and inheritance, 52–54
  - uses of, 53
- pop (), stacks, 158–159
- portrait printing, 288
- positive lookahead groups, regular expressions, 235
- positive numbers, signed integers, 135–136
- POST
  - security issue, 427
  - URL encoding, 428–429
  - URLRequest, 427–429
- potentiallyUnsafeOperation (), 382
- power of number, method call, 143
- preloader, MovieClip, 269
- preserveAlpha, convolution filter, 542
- prettyIndent, 201–202, 209
- prettyPrinting flag, XML, 201, 209
- preventDefault
  - cancelling defaults, 349
  - focus change, 359–360
- printing, 285–296
  - addPage (), 287, 289
  - aliasing, 290
  - artwork, 290–292
  - bitmap graphics, 290
  - cautions about, 291
  - color original/black-white printing issue,
    - 291–292
  - Flash features, 286
  - functionality, adding, 292–296
  - HTML page difficulties, 285
  - MovieClip frame, 289
  - orientation, 288
  - PDF files, 286–287
  - print area coordinates, 289
  - print targets as bitmaps, 290
  - print targets as vectors, 289–290
  - printer driver, 288
  - PrintJob methods, 287

- send ( ), 287
- start print request, 288
- symbol instances, 290
- target, sizing to printed page, 290–291
- priority, events, 343
- private, 59–61
  - example of, 59–60
  - functions of, 10, 59–61
  - limitations of, 61
  - runtime errors caused by, 10
- Problems view, errors displayed in, 116
- procedural programming, defined, 36
- processing instructions, XML, 208
- progress, uploading, 479
- ProgressEvent, 479
- propagation, overriding, 346
- properties, 69–73
  - accessors, 70–73
  - checking for existence of, 178
  - in classes, 69–73
  - constants, 69
  - deleting, 179
  - as nouns/adjectives, 70
  - read-only, 73
  - ReferenceError, 389
  - side effects, 73
  - variables as, 7
- property nodes, motion XML, 589–590
- protected, 61–63
  - example of, 61–62
  - functions of, 10, 61–62
- pseudorandomnumbers, generating, 145
- public, 59–61
  - and constructors, 68–69, 83
  - example of, 59

- in function statements, 97
  - functions of, 10, 59
- public class, in package block, 44
- public properties, RegExp, 239
- push( ), stacks, 158–159
- Python, XMLSocket, 447

## Q

- QName object, XML, 187
- quality
  - bevel filters, 531
  - blur filters, 527
  - drop shadow filter, 529
  - glow filter, 532
  - gradient bevel filter, 534
- quantifiers, regular expressions, 224–225, 232–233
- question mark (?)
  - in conditional operator, 24
  - regular expression quantifier, 224–225
- queue operations
  - arrays, 159–160
  - queues, uses of, 160
  - shift ( ) and unshift ( ), 159–160
- quotation marks ( ' or " )
  - with escape characters, 125
  - with strings, 124

## R

- radians, rotate ( ), 605–606
- radius, circles, 565
- randomness
  - generating, 144–145
  - uses of, 144
- randomSeed, 641, 646, 648
- RangeError, 389

- rational numbers, 134
- ratios
  - gradient bevel filter, 533
  - line gradient, 560
- readExternal ( ), 664
- read methods, reading from byte array, 658
- readObject ( ), 662
- read-only, property, creating, 73
- Real Time Messaging Protocol (RTMP)
  - FLV files, accessing with, 502–503
  - Red5, use of, 503
- receiving application, creating, 689
- rectangles
  - BitmapData, 619
  - drawing, 564–565
  - fill for, 636
  - matrix transformations, example of, 607–610
  - rounded rectangles, 566–567
- recursive functions, 108–110
  - across domains, 690–691
  - factorial, example of, 108–109
  - flash.error.StackOverflowError, 390
  - infinite loop issue, 109–110
  - situations for use, 108
  - variables, organizing on paper, 109
- Red5, 503, 521
- redArray, 644
- redMultiplier, 632
- reference data types, passing by, 99–100
- ReferenceError, 389
- references, weak and strong, 343
- reflection, 93
- RegExp.exec (str:String):Object, 214–218
- RegExp.test(str:String):Boolean, 213–214
- RegExp object, 238–239
- building, 212
- public properties, 239
- and string operations, 213–220, 238
- regular expressions
  - ActionScript 3.0 new feature, 6, 212
  - anchors, 225–227
  - backreferences, 233–234
  - boundaries, 225–227
  - character classes, 223–224
  - characters in, 221
  - contents of text, finding, 215–216
  - creating, 212
  - dot character in, 221
  - dotall flag (s), 231
  - escaped characters, 221–222
  - extended flag (x), 231–232
  - to extract/capture, 216–218
  - forward slashes with, 9
  - functions of, 211–212
  - global flag (g), 229
  - greedy/lazy matching, 232–233
  - grouping, 228
  - ignore case flag (i), 229
  - as literals, 212
  - literals in, 9
  - metacharacters/metasequence, 222–223
  - multiline flag (m), 230
  - multiple alternatives, matching, 227
  - named groups, 236–237
  - negative lookahead groups, 235
  - non-capturing groups, 234
  - non-English text, 237
  - parts of, 221–227
  - pattern matching, 130–131, 213–215
  - pipe character in, 227

**R** Index

- positive lookahead groups, 235
  - quantifiers, 224–225, 232–233
  - RegExp object, 238–239
  - to replace, 218–220
  - splitting text with, 220
    - and string operations, 130–131, 213–220
  - relatedObject, MouseEvent, 357
  - remote procedure calls, serialization/
    - deserialization, 471
  - remote security sandbox, 440
  - remote shared objects, functions of, 471
  - removeEventListener, 343
  - removeNamespace ( ), 207
  - repeatCount, 371
    - timers, 368–369
  - replace ( ), 199, 218–220
  - replaceText, 302
  - requests, denied, as errors, 414
  - reset ( ), timer, 369
  - Responder, Flash Remoting, 449–450
  - rest parameter (...), 101–102
    - adding to functions, 101–102
    - defined, 101
  - restrictCharacters, 317–318
  - resume ( ), Animation class, 597
  - resume, NetStream, 506
  - returnindexedarray, sorting, 165
  - return statement
    - in functions, 104
    - as operator, 103
    - with return data type, 104–105
    - values, returning with, 103–105
  - return type
    - in function statements, 98, 104–105
    - with return statement, 104–105
    - void, 105
  - reverse ( ), order of arrays, 163
  - rewind
    - Animation class, 597
    - sound, 492–494
  - rightactionscript.com, 690–691
  - rollOut, 261, 358–359
  - rollOver, 261, 359
  - rotation
    - with filters, 546–547
    - matrix transformations, 605–606
    - motion XML, 591–593
  - rectangles, transforming, example of, 607–610
  - rotate ( ), 605–606
    - TextField, 301
  - rounded rectangles, drawing, 566–567
  - rounding numbers, method call, 143
  - Ruby, XMLSocket, 447
  - runtime data types, ActionScript 3.0 new feature, 5
  - runtime errors
    - ActionScript 3.0 new feature, 5
    - call stack, 117–118
    - causes of, 114
    - correcting errors, 118
    - and private keyword, 10
    - strict typing mismatches, 5
    - uncaught exceptions, 399–400
    - viewing from browser, 114
  - runtime-type checking, benefits of, 105
- S**
- saturation of colors, 538–539
  - saving. *See* SharedObject; storing data
  - scaleMode, 256–257
  - scaleX and scaleY, 252, 301
    - displacement filter, 543

- scaling
  - colors, 539
  - lines, 550–552
  - matrix transformations, 604–605
  - motion XML, 591–593
  - rectangles, transforming, example of, 607–610
  - TextField, 301
- scope, 11–16
  - global, 11
  - local, 11–13
  - scope chain, 13–15
  - use, determining, 15–16
- Screen BlendMode, 253
- screen captures, copy bitmap data, 619–620
- script timeout, flash.error.ScriptTimeoutError, 390
- scroll
  - mouse, 318
  - TextField, 318–319, 325
- search ( ), 214
- search, regular expressions within strings,
  - 130–131, 213–220
- search and replace, regular expressions within
  - strings, 131, 218–220
- security, 439–441
  - error log caution, 417
  - GET and POST issue, 427
  - and loading content, 440–441
  - safeguards, 439
  - security sandbox, 439–440
  - Security.allowDomain, 440–441
  - SecurityError, 389
  - SharedObject, 461–462
  - SWF file security settings, 440
- SecurityError, 389
  - and binary socket connection, 666
  - uploading, 479
- seek, NetStream, 506
- self-commenting code, 33
- send ( )
  - printing, 287
  - to receiving application, 687–688
- send ToURL, 436, 445
- sending application
  - across domains, 690
  - creating, 687–689
- serialization
  - custom classes, storing, 469–471
  - data with byte arrays, 662–665
  - defined, 467
  - self-serializing classes, creating, 469–471
- server(s)
  - binary sockets, 665–667
  - polling, 446
  - server-side failures, 414
  - storing data on, 456
- server-side communication
  - Flash Remoting, 448–452
  - sending versus loading data, 445
  - URLLoader, 443–445
  - XMLSocket, 446–448
- setChildren ( ), 199
- setInterval ( ), 367, 375
- setLocalName ( ), 207
- setMode ( ), 516
- setMotionLevel, 518
- setNamespace ( ), 207
- set of numbers, 134
- setPixel ( ), 634–635
- setSettings ( ), 209
- setSilenceLevel, 518–519
- setTextFormat, 306
- setTimeout ( ), 375

## S Index

- settings ( ), 209
- shadowAlpha, bevel filters, 530
- shadowColor, bevel filters, 530
- Shape, 261–262
- shape(s), 564–569
  - circles, 565–566
  - ellipses, 566
  - filling, 568–569
  - rectangle, 564–565
  - rounded rectangles, 566–567
- ShapeInstance, 268
- SharedObject, 457–471
  - ActionScript versions, compatibility with, 462–463
  - custom classes, storing, 467–469
  - deleting data from, 459
  - flush ( ), 459–460, 465–467
  - HTTP connection, use of, 461–462
  - local path parameter, 461
  - LSO location, modifying, 460–461
  - LSO synchronized to SWF, 459–460
  - reading from, 458–459
  - remote shared objects, 471
  - retrieving, 458
  - saving to disk, 459
  - security, 461–462
  - serialization/deserialization, 469–471
  - size constraints, 463–467
  - SWF files, sharing data between, 460–463
  - used space, viewing, 467
  - writing to, 458–459
- sharpen effects, 542
- shear
  - matrix transformations, 604–605
  - rectangles, transforming, example of, 607–610
- shift ( ), queues, 159–160
- shiftKey, 364
- shiftKeyBoolean, 356
- side effects, properties, 73
- signed integers, 135–136
  - two's complement, 136
- silence level, microphone, 518–519
- SimpleButton, 257–258
- SimpleEase tween, 595
- sine of angle, method call, 144
- single line comments
  - forward slashes with, 32
  - uses of, 32
- size
  - FileReference, 476
  - TextFormat, 311
- skewing, motion XML, 591–593
- slice ( ), arrays, 131–132
- smoothing
  - BitmapData, 618–619
  - draw ( ), 620
- sndTransform, sound files, 491
- socket connection
  - binary sockets, 665–667
  - persistent, situations for use, 665
- some ( ), arrays, conditional processing, 166–168
- sorting
  - arrays, 163–166
  - functions for, 164–166
  - sort ( ), 163–166
  - sort flags, 165
  - sortOn ( ), 163, 165–166
- SOS, external error log, 417
- sound, 485–500
  - audio support, checking, 500

- buffering stream, 488–489
- constructors, 488
- embedded versus loaded, 489
- embedding sounds, 489–490
- fast-forward, 491–492
- file size, checking, 496
- ID3 tag, 496–497
- loading from external source, 487–489
- MP3 format, 488, 496
- panning, 495
- pause, 492–494
- playing/stopping, 490–491
- replay, 492–494
- rewind, 492–494
- sound events, 486
- Sound object, 486–487
- SoundChannel, 486–487, 490
- Sound\_Complete, 487
- SoundLoaderContext, 485–488
- SoundMixer, 485–487, 491, 497, 659
- SoundTransform, 485–487, 495
- spectrum data, 497–499
- spectrums, computing with byte arrays, 659–660
- start point, setting, 491
- volume, 495
- soundTransform, NetStream, 506
- source, draw (), 620
- sourceBitmapData, 628, 630, 632, 639, 641, 644, 652
- sourceChannel, 631
- source directory, location of, 43
- Source object, motion XML, 591–592
- sourceRect, 628, 630, 632, 639, 641, 644, 652
- source: String, 239
- span tag, 303
- speakers, panning, sound, 495
- spectrum data, sound, 497–499
- splicing
  - arrays, 160
  - splice (), 160
- split, text, with regular expressions, 220
- spreadMethod, line gradient, 560
- Sprite, 262–268
  - buttonMode, 264
  - children, setting depths of, 266
  - display objects, reparenting, 267–268
  - DisplayObject, x and y position, 250
  - dragging/dropping, 262–264
  - graphics object, use of, 254
  - hitArea, 264–265
  - hitTest, 273
  - hitTestPoint, 265
  - masks, 569–572
  - shapes, drawing, 564, 572, 578
- SQL, Flash Remoting, 450–452
- square brackets ([ ])
  - array access operator, 156
  - array literals, 9, 155
  - with character classes, 223
  - object properties, accessing, 174–175
  - XML, accessing property, 185
- square root, method call, 143
- squareRoot (), 384
- src, img tag, 304
- stack operations
  - arrays, 158–159
  - flash.error.StackOverflowError, 390
  - push() and pop (), 158–159
  - stack, defined, 158

## S Index

- stack trace, 406–407
- Stage, 255–257
  - add/remove from stage, 251–252
  - alignment, setting, 256–257
  - flexibility of, 247
  - functions of, 246–247, 255
  - importance of, 247
  - and MouseEvent, 355
  - scaleMode, 256–257
  - stageResize, 255–256
- StageX/StageY, 355
- start ( )
  - printing, 287–288
  - timer, 369–370
- startTime, sound files, 491
- static accessors, 83
- static constants, 79–81
  - enumerations, 81
  - functions of, 79
  - use versus strings, 80
- static methods, 81–83
  - functions of, 81–82
  - for utility classes, 83
- static variables, 77–78
  - accessing, 12, 15, 78
  - example of, 77–78
  - functions of, 11–12
- statically typed code, functions of, 39
- Step Over, debugging, 407–408
- Step Return, debugging, 408
- stepping through, debugging, 407
- stitch, Perlin noise, 648
- stop ( )
  - Animation class, 597
  - MovieClip, 268–269
  - timer, 369
- stopImmediatePropagation, 346
- stopPropagation, 346
- storing data
  - in browser cookie, 456
  - Global Storage Settings, 463–464
  - in local shared object, 455–457
  - on server, 456
  - space requested/space allocated, 464–467
  - Website Storage Settings, 463–464
  - See also* SharedObject
- straight line, drawing, 554
- streaming video. *See* video
- strength
  - bevel filters, 530
  - drop shadow filter, 529
  - glow filter, 532
  - gradient bevel filter, 534
- stretchFactor, 498
- Strict mode
  - compile method of, 113
  - pros/cons of, 113
- strict typing
  - arguments in, 102
  - runtime errors, 5
- string(s)
  - casting to strings, 126
  - character to character code conversion, 129
  - characters, accessing, 128–129
  - combining, 127
  - converting case of, 128
  - converting from arrays, 156–157
  - converting to arrays, 127
  - converting to other types, 126–127
  - converting to primitive equivalent, 123
  - converting to XML, 200
  - converting XML to, 200–201

- date, parsing out of, 146–147
- empty string, use of, 157
- escape sequences, 124–125
- escaped characters, use of, 124
- indexes in, 128, 130
- numeric conversions, 141–142
- RegExp object actions, 213–220, 238
- search and replace, 131
- search and replace within, 218–220
- search within, 130–131, 213–220
- single or double quotes, 9
- substring, accessing, 131–132, 213
- TextField, retrieving from, 302
- toString, 125–126
- String.match(pattern: \*):Array, 216–217
- String.replace(pattern: \*, repl:Object):String, 218–220
- String.search(pattern: \*):int, 214
- String.split(delimiter: \*, limit:Number=0x7fffffff):Array, 220
- StyleSheet, TextField, 305
- subclass
  - and polymorphism, 52–53
  - private, lack of access, 10
  - superclass, accessing methods of, 107
- subexpressions, evaluate in parentheses first, 143
- sub-procedures, functions of, 105
- subset, arrays, extracting, 160–161
- substr ( ), 131–132
- substring(s)
  - accessing, 131–132, 213
  - searching by, 130
- substring ( ), 131–132
- Subtract BlendMode, 253
- subtraction operator (-), 18, 142
- sumSomeNumbers, 385
- superclass
  - accessing methods of, 107–108
  - data type as, 17
  - limitations of use, 83
  - overriding behavior, 49–50, 108
  - super keyword, 107
- superset of numbers, 134
- .svg, 282
- swapChildren, 266
- .swf, 282
- SWF files
  - in Debug Flash Player, 385–386
  - embedding in web page. *See* web pages
  - embedding, TextField, 304–305
  - FLV file, loading into, 506–507
  - frame rate, 582
  - HTML values, passing to, 676–677
  - JavaScript functions, calling from, 682–683
  - loading, 437–439
  - security settings, 440
  - VerifyError, 389
- SWFAddress, 672
- SWFFix, 672
- SWFMacMouseWheel, 672
- SWFObject, 672–678
  - constructors, 674
  - Flash, embedding in web page, 673–674
  - Flash options, enabling, 674–675
  - home page, 673
- switch statement, 23–24
  - break with, 23
  - functions of, 23
- symbol(s), 277–281
  - class name, choosing, 279–280

**S** **Index**

- custom class for, 280–281
- drawing, converting to symbol, 278–279
- functions of, 277–278
- variable name, setting, 280

symbol instances, printing, 290

SyntaxError, 389

**T**

tab(s)

- input TextField, 323
- tabStops, TextFormat, 311–312

tab character, escape sequence, 124, 222

tab-enabled

- interactive objects, 258
- tabEnabled, 323
- text fields, 323

tags

- embed tag, 282, 616
- HTML, 303–304
- ID3 tag, sound, 496–497
- motion XML, 588

tangent of angle, method call, 144

targets

- events, 334
- printing, 289–291
- target phase, event flow, 344–345
- TextFormat, 312

TextField, 300–306

- antialiasing, 314–315
- background, 305–306
- change event, 325
- characters, restricting in, 317–318
- embedded fonts, 313
- focusIn and focusOut, 325–326
- grid fitting, 315

- HTML display, 303–304
- images, embedding, 304–305
- as input field, 323–324
- link event, 326–327
- multiline property, 319–322
- new, creating, 300
- numLines, 315–316
- rotation, 301
- scaling, 301
- scroll, 318–319, 325
- size, setting, 300–301
- strings, retrieving, 302
- StyleSheet, 305
- SWF files, embedding, 304–305
- tab-enabled, 323
- text, adding to, 300
- textInput event, 324–325
- TextMetrics, 319–322
- Unicode, display of, 322
- wordwrap, 316

TextFormat, 306–313

- align, 307
- applying to TextField, 306–313
- blockIndent, 308
- bold, 308
- bullet, 308
- color, 309
- font, 309
- indent, 309–310
- italic, 310
- leading, 310
- leftMargin, 310–311
- overriding, 306–307
- size, 311
- tabStops, 311–312

- target, 312
- underline, 312
- url, 312–313
- TextInput event, 324–325
- TextLineMetrics, 321–322
- TextMetrics, 319–322
- text nodes, XML
  - accessing text within elements, 190
  - defined, 184
- texture effects
  - displacement filter, 543–544
  - noise, 646–653
- thickness, lines, 550
- this, with instance variables, 15
- threshold ( ), 639–641
- time. *See* date and time
  - NetStream, 506
- timeChange, MotionEvent, 598
- time zones, 148
- timeline animations, 584, 587
- timer(s), 367–375
  - ActionScript 3.0 new feature, 367
  - animation with, 584–585
  - creating, 368
  - functions of, 367
  - getTimer ( ), 150, 375
  - reference to timer, creating, 371
  - timeout, creating, 372–373
  - world clock, creating, 373–375
  - See also* TimerEvent
- TimerEvent
  - currentCount, 369, 371
  - delay, 368, 371
  - event types in, 368–369
  - listening for, 368–369
  - repeatCount, 368–369, 371
  - resetting timer, 369
  - starting timer, 369–370
  - stopping timer, 369
  - Timer, 368, 371
  - Timer Complete, 369
- tinting
  - applying tint, 539–540, 594
  - display objects, 611–612
- TODO comment, 32
- toExponential ( ), 141
- toFixed ( ), 141
- toLowerCase ( ), 128
- toPrecision ( ), 141
- toString ( ), 125–126, 141, 156, 190, 200–201
  - URLVariables, 435
- totalFrames, MovieClip, 269
- toUpperCase ( ), 128
- toXMLString ( ), 185, 190, 200
- trace ( ), 154, 190
- trace ( ) output, error log method, 416
- traceArray ( ), 162
- transform, DisplayObject, 252
- transformations
  - color transforms, 610–614
  - Flash motion package, 598
  - matrix transforms, 603–610
  - motion XML, 591–592, 598
  - noise, 646–653
- transition effects, applying, 639–641
- translation
  - matrix transformations, 605
  - rectangles, transforming, example of, 607–610
- transparent
  - BitmapData, 619
  - Flash in web page, 675
- trinary operators, defined, 17

## T

## Index

- trigonometric functions, methods and
    - returns, 144
  - true, Boolean value, 9, 19
  - try block, 382–385
  - Tweener, animation with, 599–600
  - tweens
    - animation, 588–589
    - iTween objects, 595–597
  - two's complement, 136
  - type(s)
    - base types, 37
    - bevel filters, 531
    - classes as, 37, 89–94
    - compatibility of, 90, 93
    - defined, 39
    - determining, 93
    - dynamically typed code, 39
    - events, 334, 342
    - explicit type conversion, 91–93
    - FileReference, 476
    - gradient bevel filter, 534
    - implicit type conversion, 90–91
    - line gradient, 560
    - statically typed code, 39
    - type safety, 39
  - type annotations, defined, 84
  - Type Coercion Error, 158
  - TypeError
    - built-in exception, 389
    - Error#1009, 118
  - typos, errors caused by, 119
- U**
- UFO, 672
  - uiContainer, 349
  - uint type
    - caution in use, 138
    - functions of, 138
  - unary operators, defined, 17
  - undefined, 9
  - underline
    - HTML tag, 303
    - TextFormat, 312
  - Unicode
    - display of, 322
    - escape character for, 125, 222
  - Uniform Resource Identifier (URI), URIError, 389
  - Uniform Resource Locator. *See* URL
  - uniquesort, 165
  - unload, 437
  - unmute, microphone, 518
  - unshift ( ), queues, 159–160
  - unsigned integers, 135
  - updateAfterEvent, 583–584
  - upgrade, Flash Player, Express Install, 678–679
  - uploading files, 474–482
    - browse ( ), 474–476
    - file properties, retrieving, 476–478
    - file selection for, 474–475
    - FileReference, 473
  - upperLeftRadius/upperRightRadius, rounded
    - rectangles, 567
  - URIError, 389
  - url, TextFormat, 312–313
  - URL
    - Remoting Gateway, 448
    - sendToURL, 436
    - sound, loading from, 488
    - URL encoding, 428–429
    - URLLoader, 429–434

- URLRequest, 426–429
  - URLStream, 435–436
  - URLVariables, 434–435
  - URLLoader
    - event listeners, 430–431, 434
    - events dispatched by, 431–432
    - functions of, 429
    - images, loading, 660–661
    - loading, steps in, 430–431
    - preloader, creating, 432–434
    - server-side communication, 443–445
    - URLVariables, loading, 434–435
  - URLRequest
    - downloading files, 482
    - GET, 427–429
    - navigateToURL, 427
    - POST, 427–429
    - sound, loading, 487–488
  - URLVariables, loading, 434–435
  - useCapture, 345
    - events, 343
  - useWeakReference, functions of, 343
  - utility classes, creating with static methods, 83
- V**
- value(s)
    - in arrays, accessing, 156
    - assigned by variables, 8
    - checking for existence of, 178
    - data types, passing by, 99–100
    - defined by constants, 8–9
    - extracting from arguments, 102
    - literals, 9
    - null, checking for, 22
    - and operators, 17–19
    - return statement, 103–105
    - stored in variables, 25
    - types of, 9
  - valueOf(), 123
  - variables, 7–17
    - class or instance, use, determining, 15–16
    - class variables, 15
    - constants, 8–9
    - data types, 16–17
    - declarations, parts of, 8
    - errors related to, 119
    - function-level, 12–13
    - functions of, 7, 9–10
    - instance variables, 12, 16
    - naming, 98
    - objects contained in, 7
    - overriding, 13–15
    - as properties, 7
    - public and private, 59–61
    - scope, 11–16
    - static variables, 11–12, 77–78
    - untyped, wildcard (\*) data type with, 17
    - values stored in, 25
    - var keyword in, 8
  - Variables panel
    - configuring, 404
    - and debugging, 402–404, 411
    - in Flex Builder, 404
  - vector artwork, printing, 290
  - vector graphics. *See* drawing
  - VerifyError, 389
  - vertical space, img tag, 304
  - video, 501–514
    - camera, attaching to, 516–517
    - cue points, 502

## V

## Index

dimensions, viewing, 509  
 displaying video, 507  
 encoding, 502  
 file formats, 502  
 Flash Media Server, use of, 502–503  
 Flash Video Encoder, 501–502  
 FLV files, accessing with HTTP, 503–504  
 FLV files, accessing with RTMP, 502–503  
 FLV files metadata, 508–509  
 FLV files, playback, 506–508  
 NetStream, 505–509  
 playback application, example of, 509–514  
 queue, adding videos to, 501–502  
 trimming, 502  
 Video class, 504–505  
 visibility modifiers. *See* access controls  
 VNC (virtual network computing), 667  
 void, 9  
     data type, 105  
     return type, 105  
 volume, sound, 495  
 vspace, img tag, 304

## W

warn, error severity, 418  
 warnings, compiler, 114  
 water ripple effect, applying, example of, 652–653  
 weak references, functions of, 343  
 web pages  
     Express Install, Flash upgrade, 678–679  
     Flash, embedding in, 671–674  
     full-screen Flash, 675–676  
     HTML/Flash application, example of, 683–686  
     JavaScript. *See* JavaScript and Flash  
     SWFObject, 672–678

transparent Flash, 675  
 variables, passing from HTML, 676–677  
     *See also* HTML  
 Website Storage Settings, 463–464  
 while loops, 29–30  
     do..while, 30  
     functions of, 29  
     versus for loops, 30  
 whitespace  
     character class, 224  
     extended flag (x), 231–232  
     XML, removing, 201  
 width  
     BitmapData, 619  
     ellipses, 566  
     img tag, 304  
     rectangles, 565  
     rounded rectangles, 567  
     TextMetrics, 321  
 wildcard (\*) data type, functions of, 17, 105  
 wildcard (\*) operator, import all classes, 45–46  
 word boundary, 227  
 word characters, character class, 224  
 wordwrap, 316  
 world clock, creating, 373–375  
 writeBoolean (), 658  
 writeExternal (), 664  
 write methods, write to byte array, 658  
 writeObject (), 662

## X

x and y locations  
     circles, 565  
     ellipses, 566  
     Keyframe, motion XML, 593

- rectangles, 565
- rounded rectangles, 567
- XML, 183–210
  - access operators, 185
  - and ActionScript 3.0, 184, 187
  - ActionScript code embedded in, 185
  - animation. *See* motion XML
  - basic structure of, 183–184
  - comments, 208
  - converting to strings, 200–201
  - ECMAScript for XML. *See* E4X
  - embedding in ActionScript code, 184, 591
  - external sources, loading data to, 203
  - global settings, 209
  - information sources on, 183
  - literals, 9, 184–185
  - loading files, 433–434, 439
  - namespace, 186–187, 205–207
  - node content, determining, 204
  - node types, determining, 203–204
  - nodes, combining, 193–195
  - nodes, removing, 197–198
  - as objects, 180
  - objects, duplicating, 198–199
  - plus (+) and plus equal sign (+=) operators, 194–195
  - prettyPrinting flag, 201–202
  - processing instructions, 208
  - QName object, 187
  - socket on server. *See* XMLSocket
  - string formatting, 201–202
  - strings, converting to, 200
  - syntax, 185
  - text nodes, normalize, 202
  - values, combining, 195–197
  - values in nodes, replacing, 199
  - XML comments, 32
  - XML object, 186
  - XMLDocument, 187
  - XMLElement, 186
- XMLSocket, 446–448
  - code, examples of, 447
  - return values issue, 448
  - XMLSocket object, creating, 446–447