

Index

Note to Reader: **Bolded** page numbers refer to definitions and main discussions of a topic. *Italicized* page numbers refer to illustrations.

-
- #
- 2D (two-dimensional) drawings, from
 - 3D data, 37–79
 - adding dimensions. *see* dimensions
 - assembly drawings, 74–75, 75
 - associativity, 71–74, 72–73
 - creating auxiliary view, 48–50
 - creating base views, 40–41, 40–44, 43–44
 - creating projected views, 44–48, 45–48
 - creating section views, 53–55, 54–55
 - detail views, 75–77, 76–77
 - detailing drawing views, 55–59, 55–59
 - drawing views of a part, 38–40, 38–40
 - Hole/Thread Notes, 68–69, 68–69
 - presentation views, 77–78
 - Retrieve Dimensions, 70–71
 - rotating view, 50–53
 - 3D display modes, 15–16
 - 3D (three-dimensional) Grip
 - controlling, 235
 - defined, 234
 - editing, 235–237, 235–237, 320–321, 321
 - 3D (three-dimensional) models, making, 104–108, 105–108
-
- A
- Absolute Angle, rotate view, 50–51, 51
 - adaptive modeling, 300–303, 300–303
 - Add button, project files, 31
 - advanced part modeling. *see* part modeling, advanced
 - Angular constraint, assemblies, 140, 140, 148–149, 149
 - angular dimensions, 60, 62, 62, 127, 127
 - Animate Constraints dialog box, 387–389
 - Animate Fade tool, 386, 386–387
 - Animate tool, 333–334
 - animation, Inventor Studio, 383–389
 - assembly constraints, 387–388, 387–389
 - cameras, 385, 385–386
 - overview of, 383, 383
 - part fades, 386–387, 386–387
 - timeline settings, 384, 384–385
 - animation, of assemblies
 - constraints, 387–388, 387–389
 - overview of, 328
 - preparing for, 328–330, 329
 - using Drive Constraint dialog, 330, 330–331
 - working with, 331
 - Animation Options dialog box, 384–385
 - Animation Timeline tool
 - animating cameras, 385, 386
 - overview of, 383, 383
 - setting, 384–385, 384–385
 - annotation
 - expanded dimensioning. *see* dimensioning, expanded
 - keyboard shortcuts, 395
 - sketch-derived views. *see* sketch-derived views
 - weldment tool features, 340
 - antialiasing, renderings, 371–372
 - Application Options dialog box, 19
 - Assembly tab, 25
 - Colors tab, 21, 21
 - creating new work environment, 25–28, 27–28
 - Display tab, 21–23, 22
 - Drawing tab, 23
 - General tab, 19, 20
 - Hardware tab, 23
 - Help button, 20
 - Import and Export buttons, 20
 - overview of, 19, 19–20
 - Part tab, 25
 - Sketch tab, 23–25, 24
 - Apply button, 2
 - arcs
 - creating, 246
 - creating bolt circles with Centerline tool, 58
 - creating holes, 113
 - creating lip using Sweep tool, 269
 - creating with Line tool, 230–231, 231

- radius dimensions using, 63
 - sketch constraints for, 87
 - using Hole feature, 115–120
 - arrow buttons, 2, 31
 - aspect ratio, renderings, 370
 - assembly constraints, creating, 138–152
 - animating assemblies, 328–330
 - beginning assembly, 141–150
 - editing parts, 150–152, 150–152
 - overview of, 138–139
 - Place Constraint tool, 139–141, 139–141
 - assembly modeling, 137–167
 - concept of, 138
 - constraints. *see* assembly constraints, creating
 - creating breakout view, 205–207, 206–207
 - creating simple drawing, 74–75, 75
 - keyboard shortcuts, 396
 - using Bolted Connection Design Accelerator, 163–167, 164–167
 - using enabled parts, 156–157, 157
 - using representations, 153–156, 155
 - using standard parts, 157–163, 158–163
 - assembly modeling, advanced, 293–340
 - animation within assembly, 328–331
 - Derived Parts, 319–321, 320
 - Design Accelerators. *see* Design Accelerators
 - iAssembly, 323–328, 324–327
 - Move and Rotate Component tools, 322–323
 - overview of, 294
 - positional representations, 336–338, 336–339
 - presentation files, 331–336, 332–335
 - weldments, 339–340, 340
 - assembly-oriented dimensions, 222–226
 - bill of materials, 225–226, 226
 - placing parts list in drawing, 222–223, 223
 - using Auto-Balloon tool, 223–226, 224–225
 - using Balloon tool, 223–224
 - Assembly tab, Application Options dialog box, 25
 - Assembly tab, Place Constraint tool, 139–141, 140
 - associativity, 71–74, 72–73
 - Attach Balloon tool, 225
 - AUGI (Autodesk User Group International), 400
 - Auto Balloon tool, 223–226, 224–225
 - AutoCAD_Related_Options.xml file, 20
 - Autodesk Labs, 399
 - Autodesk Manufacturing Community, 399
 - Autodesk Vault. *see* Vault
 - auxiliary views, creating, 48–50, 48–50
 - Available Styles tab, Style and Standard Editor, 176
 - Axle support
 - changing enabled part state, 156–157, 157
 - creating 3D model, 104–106
 - creating assembly constraints, 143, 145–149, 145–150
 - creating View representation, 154–156
-
- B
- background
 - color options, 21, 25
 - images, 26
 - wireframe display modes, 22
 - Background tab, Scene Style dialog box, 377–378
 - Balloon tool, 223–224, 223–226
 - Base View dialog box, 74, 175
 - Base View tool
 - creating assembly drawing, 74
 - creating base views, 40–41, 40–43, 43
 - saving drawing file, 43–44, 44
 - Baseline Dimension Set tool, 64–65, 65
 - Baseline Dimension tool, 64–65, 65
 - Bearing Generator
 - Calculation tab, 297, 297–298
 - Design tab, 296, 296–297
 - overview of, 295–296, 296
 - selecting bearings, 298–299, 299
 - Bend Notes tool, 367–368, 367–368
 - Bend tab, Style and Standard Editor, 345–346, 346
 - bill of materials, 225–226, 226
 - bolt circles, creating, 58, 58
 - Bolted Connection Design Accelerator, 163–167, 164–167
 - borders, template, 185–186, 186
 - Break dialog box, 196, 196–197
 - break out view
 - creating, 204–205, 204–205
 - creating for assembly, 205–207, 206–207
 - Hole feature, 203–205
 - overview of, 203, 203–204

Break tool, 196, 196–197
 break view, 196–199, **196–199**
 Browse for Folder dialog box, 32
 Browser bar, 17, 27–28, 28
 buttons, Project File manager, 31
 buttons, using, 2, 2

C

Calculation tab, Bearing Generator, 297, **297–298**
 Calculation tab, Shaft Component Generator, **307**, 313
 Calculation tab, Spur Gear Component Generator, 316, **316**
 Camera tool, 371
 cameras, animating, 385, **385–386**
 Cancel button, 2
 Cancel setting, Open dialog box, 6
 Center Mark tool, 55–56, 56
 Center Point Arc tool, **246–248**, 247–248
 Center Point Circle, **246**
 Center Point option
 Hole feature, 113, **123**
 Origin Center Point. *see* Origin Center Point
 sketch dimensions, 95
 Centerline Bisector tool, **58–59**, 59
 Centerline setting
 using Ordinate Dimension Set tool, **218–219**, 219
 using Revolve tool, 131–132
 using sketch dimensions, 95
 Centerline tool
 creating bolt circle with, **58**, 58
 creating centerline bisector with, **58–59**, 59
 placing centerline in view, **56–57**, 57
 Chamfer Notes, 221
 Chamfer tool
 adding beveled edges in weldment, 340
 adding chamfer to end of shaft, 309–310
 creating turned part, 134
 Change View Orientation icon, **41**
 Character Exclude settings, Style and Standard Editor, 174
 child views, 40, 82
 circles, sketch constraints with, **237–238**, 238
 Circular Pattern tool, 244–245, **244–245**
 Clearance Hole, Hole dialog box, 114–115

click-sensitivity, General Dimension tool, 60
 Coil tool
 generating springs, **275–278**, 276–278
 overview of, **274**
 tabs, 274–275, **274–275**
 Coincident constraint
 defined, **87**
 editing title block text, 188–189
 viewing in existing sketch, 89
 Collinear constraint, **87**, 132
 color settings
 Illustration rendering styles, **373**, 373
 layer styles, 182–183, **182–183**
 scene styles, background, 377
 View representation, **154–156**, 155
 Colors tab, Application Options dialog box, **21**, 21, **25**
 commands, restarting, **46**
 Communication Center, **18**
 Component Opacity, 16, **16**
 component overrides, 207–208, **207–208**
 Component tab, Drawing View dialog box, 41
 Components tab, iAssembly Author dialog box, 325
 Concentric constraint, **87**
 Concentric placement, Hole dialog box, 113
 Conditions tab, Loft tool, **251**, 251
 Constrain Component tool, **148**
 Constrained Orbit tool, **13**
 Constraint Inference, **96**
 Constraint Persistence, **96**
 constraints
 adaptive modeling using, **301–302**
 animated assemblies using, **328–330**
 assembly. *see* assembly constraints, creating
 moving or rotating parts after applying, **322–323**, 322–323
 sketch. *see* sketch constraints
 Construction geometry
 sketch constraints and, **96–98**, 97
 sketching layout, **247–248**, 248
 Content Center
 assembly modeling, **157–163**, 158–163
 importance of installing, **157**
 overview of, **31**
 context menus
 creating projected view, **44–45**, 45
 options for baseline dimensions, 65, **65–66**
 overview of, 3

Contour Flange tool, 359–361, **359–361**
 Convert to Weldment dialog box, **340**
 Corner Round tool, **357–358**, 358
 Corner tab, Style and Standard Editor, **347**, 347
 Counterbore, Hole dialog box, 114
 Countersink, Hole dialog box, 114
 Create New Folder icon, 4
 Create New Folder tool, **43–44**
 cropped views, **209–210**, 209–210
 Curves tab, Loft tool, **250**, 250
 Customization dialog box, **290**
 Cut tool, 364, **364**, 364
 Cutout Shape, Detail View tool, 76

D

Default Hatch Style, **177–178**, 178
 Default Thread Edge Display tool, 175
 Definition in Base View option, **48**
 degrees of freedom. *see* DOF (degrees of freedom)
 Delete Features dialog box, 285, **285**
 Depth option, Break Out dialog box, 203–204
 Derived Parts, **319–321**, 320
 Design Accelerators, 294–319
 Bearing Generator, 295–297, **295–299**
 Bolted Connection, 164–167, **164–167**
 dialog boxes, **295**
 Engineer's Handbook, **318–319**, 319
 Key Connection generator, **318**
 Mirror Components, 303–305, **303–306**
 overview of, **163**, **294–295**, 295
 resources for, **274**
 Shaft Generator. *see* Shaft Component Generator
 Spur Gears Component Generator, **314–318**, 315–318
 starting new assembly, 295, **295**
 using adaptive modeling, **300–303**, 300–303
 Design Doctor, Help system, **34–35**, 35
 Design tab, Bearing Generator, 296, **296–297**, 299
 Design tab, Shaft Component Generator, 306, **306–307**
 Design tab, Spur Gear Component Generator, **315**
 Design window, 7, **17**
 detail views, 75–77, 76–77

dialog boxes
 Design Accelerator, **295**
 learning to use, 2, **2–3**
 diameter dimensions, **62–63**, 63
 digital prototyping, 137. *see also* assembly modeling
 dimensioning, expanded, 210–226
 assembly-oriented dimensions, **222–226**, 223
 keyboard shortcuts, **395**
 Leader Text tool, **214**
 part dimensions, **217–222**, 219–222
 properties, **211–213**, 212–213
 revision tables and tags, **215–217**, 216–217
 surface texture callouts, 215, **215**
 Text tool, **213–214**
 dimensions, 59–67. *see also* dimensioning, expanded
 adding, **59–63**, 60–63
 adding sketch, **89–94**, 91–92, 94
 assembly-oriented, **222–226**, 223–226
 with Baseline Dimension tool, **64–65**, 65
 creating new style, 179, **179–180**
 creating slice view, 200
 editing tools, **65–67**, 67
 with Hole tool, 117
 modifying title block, **187**
 overview of, 59
 with Retrieve Dimensions tool, **70–71**, 70–71
 with Revolve tool, 132–133
 Display options
 Break dialog box, 196
 Break Out dialog, 204
 Detail View tool, 76
 Inventor Standard toolbar, **14–17**, 15–16
 Sketch tab, **24**
 Display Options tab, Drawing View dialog box
 assembly drawings, 74
 base views, 41
 break views, 198
 component overrides, 208
 presentation views, 78
 Display tab, Application Options dialog box
 adding advanced fillets, 259
 creating basic part, 351, **351**
 creating work environment, **26–27**, 27
 overview of, **21–23**, 22
 Distance, Hole dialog box, 114

documenting, iAssembly, **326–328**

DOF (degrees of freedom)

- adding dimensions to sketches, **90–91**, 91
- construction geometry, **96–98**, 97
- displaying for sketch, **89**
- removing for assembly constraints, **138–139**
- turning on for assembly constraints, **143–144**, 144
- viewing, *146–147*, **146–147**

draft, adding to extruded surface, 249

drag-selection, **131**

Drawing Annotation panel, **55**, 367–368

Drawing tab, Application Options dialog box, **23**

Drawing View dialog box, **40–42**, 41, 77–78

drawing views

- detailing, *55–59*, **55–59**
- Drawing Views panel for, 39, 40
- keyboard shortcuts, **395**

Drill Point, Hole dialog box, 114

Drilled, Hole dialog box, 114

Drive Constraint dialog box, 330, **330–331**

driven dimensions, **95**

E

Edge Fillet, Fillet dialog box

- adding edge fillet, **110–113**, *111–112*
- overview of, **108–110**

Edge option, Rotate View dialog box, **50–51**, 51

edges

- adding flanges to. *see* Flange tool
- adding hems to, 362–363, **362–363**
- autoprojecting, Sketch tab, **24**
- Style tab options for Illustration rendering, 373, 373

Edit button, project files, **31**

Edit Dimension dialog box, **66**, 211–213

editing

- 3D grips, **235–237**, *235–237*
- adding Hole/Thread Notes, *68–69*, **68–69**
- dimensions, **24**, **65–67**, 67, 211
- Hole Tables, **221–222**
- one member of iPart family, **291–292**
- parts in assemblies, **150–152**, *150–152*
- project files, 29
- properties, 187
- shafts, **312–314**, *313–314*

- title blocks, **187–190**, *187–190*
- using Baseline Dimension Set tool, **65–66**
- using degrees of freedom, **89**
- using Design Accelerator, **312–314**

education community, Autodesk, **400**

Ellipse tool, **246**, 247

Emboss tool, *240–243*, **240–243**, 364

Enabled display, Application Options dialog box, 22

enabled parts, **156–157**, 157

End of Part icon, 127, 127

Engineer's Handbook, **318–319**, 319

English template folder, **191**

environment, keyboard shortcuts, **394–395**

Environment tab, Scene Style dialog box, 378, **378–381**

Equal constraint, **87**, 132

exploded views, 77, **331–336**

Export button, Application Options dialog box, **20**

exporting

- file formats, **397**
- flat pattern data, 368

Extents options, Revolve tool, **129–130**

Extrude tool

- making 3D model, **103–107**, *105–107*
- modifying part with parametric dimensions, **107–108**, 108
- overview of, **103**, 103
- Revolve tool vs., 129
- sketching layout, 247

F

Face Fillet, Fillet dialog box, 108–109

Face tool

- adding flanges, **356**
- creating basic sheet metal part, *351–352*, **351–352**
- overview of, 350, **350–351**

feature libraries, **134–136**, 135

features

- deleting, **285**
- parametric modeling revolving around, **82**

Fence Shape, Detail View tool, 76

File display, Open dialog box, 5–6, **5–6**

file formats, import and export, **396–397**

File List, Open dialog box, **4**, 5

File Name, display by, **5–6**

File Names dialog box, **305**

Files of Type, display by, 5–6

Fillet tool

- adding advanced fillets, 259–261
- adding edge fillet, 110–113, 111–112
- applying work features, 125–126, 126
- creating nose cone, 272–273
- overview of, 108, 108–110

filters, 160

Filters list, 10

Find tool dialog box, 6, 6

Fix constraint, 87, 92

Flange tool

- adding flanges, 353–359, 354–359
- Contour Flange tool, 359–361, 359–361
- overview of, 352, 352
- Shape tab, 352–353

Flat Pattern tool, 355, 355

Flush constraint, assemblies

- adaptive modeling, 302
- applying, 151–152, 152
- defined, 140

Folder Options, project files, 30

folders

- creating assembly, 142–143, 143
- creating for project file, 32, 32
- iAssembly, 325

Format Text dialog box, 189–190, 213, 213–214

Free Orbit tool, 12–13

Frequently Used Subfolders, 4, 4, 29–30, 33

From Sketch placement, Hole dialog box, 113

Front View Plane tool, 175–176

Full Round, Fillet dialog box, 108–109

function keys, keyboard shortcuts, 394

functional design, 116

Funnel icon, Place From Content Center tool, 160

G

Gap options, Break dialog box, 197

General Dimension tool

- adding angular dimensions, 62, 62
- adding basic dimensions, 60, 60
- adding diameter and radius dimensions, 62–63, 63
- adding dimensions to sketches, 90, 92–93, 102–103, 102–104
- applying work features, 123, 127

- dimensioning with complex selections, 61, 61
- overview of, 59–60

General tab, Application Options dialog box, 19, 20–21

General tab, Render Image dialog box, 370–371, 371

General tab, Style and Standard Editor, 173–174, 174

geometry

- parametric modeling concepts, 82–83
- placing constraints on, 84–86
- sketch dimensions simplifying, 90
- viewing existing constraints, 88, 88–89

Geometry tab, Punch tool, 365, 365

gesturing, 85

Go To Last Folder Visited icon, 4

graphical user interface. *see* user interface

Graphs tab, Shaft Component Generator, 307, 313

Ground Plane setting, scene styles, 378

Ground Shadow, 15–16

grounded state, assembly constraints, 138

GUI (graphical user interface). *see* user interface

H

Hardware tab, Application Options dialog box, 23

Hatch pattern, 177–178, 178, 183

Height setting, renderings, 370

Help button, Application Options dialog box, 20

Help system, 34–35, 35

Hem tool, 362–363, 362–363

Hidden Edge Display option, 15

Hide All Degrees Of Freedom, sketch constraints, 96

Hole dialog box, 113–115, 113–115

Hole tables

- creating, 220, 220
- modifying, 221–222, 221–222
- overview of, 219–220

Hole/Thread Notes, 68–69, 68–69, 180

Hole tool

- adding bolts manually, 158–163, 158–163
- applying work features, 123–124
- using, 115–120, 116–120
- using Hole dialog box, 113–115, 113–115

holes, adding with Punch tool, 365–366

Horizontal constraint, 87

iAssembly, 323–328
 creating simple, 324–325, **324–325**
 documenting, 326–327, **326–328**
 overview of, 322–323, **323**

iAssembly Author dialog box, **324–325**, 325

Illustration rendering
 creating, 376, **376**
 defined, **371**
 Style tab options for, **372–373**, 372–373

Image Sphere setting, scene style
 background, 377

images, background
 overview of, **26**
 scene styles, **377–379**

Import button, Application Options
 dialog box, **20**

importing, file formats, **397**

inference lines, section views, 54–55

Insert constraint, assemblies
 adaptive modeling, **302–303**
 applying, **147–148**, 148
 creating simple iAssembly, 324
 editing shafts, 314
 overview of, **140**, 140

intelligence, with assembly constraints, 138

Inventor LT, 3

Inventor, overview of
 customizing. *see* Application Options
 dialog box
 dialog boxes, 2, 2–3
 Help system, **34–35**, 35
 New File dialog box, **7–8**, 8
 Open dialog box, **3–7**, 3–7
 project files. *see* project files
 user interface. *see* user interface

Inventor Project wizard, **31–32**, 32

Inventor Standard toolbar
 Display options, **14–17**
 Style and Standard Editor, **172–173**
 tools of, **8–13**

Inventor Studio, 369–389
 creating animation in, 328, **383–389**
 creating rendering, **370–376**
 overview of, 370
 scene styles, 376, **376–381**
 surface styles, **381–382**, **381–383**

Inventor_Default_Options.xml file, 20

iPart Author dialog box, **287–288**, 291

iParts, 286–292
 converting existing part to, **287–290**,
 288–290
 editing one member of iPart family, 291,
291–292
 overview of, **286–287**
 parameters, **287**

isometric view
 adding dimensions in, **103**
 creating, 46
 creating slice view, **199–201**
 editing, 52–53
 removing break inheritance from, 198–199

Join tool, **103**

K

Key Connection generator, **318**

keyboard shortcuts
 accessing Help system, 34
 guide to, **393–396**
 on Inventor Standard toolbar, **12**

L

Labs, Autodesk, **399**

layers, editing style, 181–183

layers, editing style of, **180–183**

layout, sketching, **247–248**, 247–249

Leader Text tool, 214, **214**, 214

libraries
 feature, **134–136**, 135
 project file, **30**

Lighting Style setting, renderings, **371**, 375

Limits tolerance, 211–212

Line tool, **230–231**, 231

Line Weight option, layer styles, 182

Linear placement, Hole dialog box, 113

linetypes, specialized, **95–96**

lips, creating recessed, **268–271**, 268–271

Local Styles, **183–185**

Location setting, project files, **30**

Location tab, Thread tool, **232–233**

Lock Aspect Ratio checkbox, renderings, 370

LOD (Level of Detail) representations,
 assembly modeling, **153–154**

Loft command, 254
 Loft tool, 250–256
 Conditions tab, 251, 251
 Curves tab, 250, 250
 overview of, 250, 250
 setting up for next feature, 252–256,
 252–256
 Transition tab, 251, 251, 251
 using as primary feature, 271–273,
 271–273
 using with Mirror tool, 280–283
 Look At tool, 13, 230
 Look In field, Open dialog box, 4

M

manager buttons, project files, 30–31
 manual override, radius and diameter
 dimensions, 63
 Manufacturing Community, Autodesk, 399
 manufacturing-focused toolset, 342
*Mastering Autodesk Inventor 2009 and
 Autodesk Inventor LT 2009* (Waguespack,
 et al.), 10–12, 274
 Mate constraint, assemblies, 140, 140, 145
 Material Hatch Pattern Defaults tab, Style
 and Standard Editor, 177–178, 178
 Member Scope, iPart, 291–292
 menu bar, 8, 8–9
 merge options, Hole table, 221
 Messages, Bearing Generator, 298
 Metric template folder, 191
 Mirror Components tool, 303–305, 303–306
 Mirror tool, 278–284, 278–284
 Model State tab, Drawing View dialog box,
 41, 77
 More button, 2
 More tab, Shell tool, 262–263
 Motion tab, Place Constraint tool, 141, 141
 Move Component tool, 322–323

N

naming
 mirroring assembly, 305, 305
 new standards, 172
 renderings, 371
 navigation controls, 4
 Open dialog box, 5

New File dialog box, 7–8, 8
 New Style Name dialog box, 172–173, 179
 nose cone, creating, 271–273, 271–273

O

Object Defaults tab, Style and Standard
 Editor
 editing layer's style, 180–183
 overview of, 176–177, 176–177
 working with object defaults, 178, 178–179
 object styles, 177, 178, 178
 Offset setting, assembly constraints, 141
 OK button, 2
 OldVersions directory, project files, 30–31
 On Point placement, Hole dialog box, 113
 Open dialog box
 beginning new drawing from template,
 38–40
 file display, 5–6, 5–6
 navigation controls, 4–5, 5
 opening file, 6–7, 7
 other controls, 6
 overview of, 3
 shortcuts and File List, 4–5, 5
 Open Documents in Session, status bar, 18
 Open From Vault tool, 10
 Open setting, Open dialog box, 6
 Options setting, Baseline Dimension
 Set tool, 65
 Options setting, Open dialog box, 6
 Options setting, project files, 30
 Orbit tool, 12–13
 Ordinate Dimension Set tool, 218–219, 219
 Orientation group, Drawing View dialog box, 41
 Orientation options, Break dialog box, 196
 Orientation options, Sweep tool, 268
 Origin Center Point
 Loft tool, 271–272
 sketch constraints, 98–100
 using Place Constraint tool, 142
 using Revolve to create turned part, 130
 osnap options, AutoCAD, 84
 Output tab, Render Animation
 dialog box, 388, 388
 Output tab, Render Image dialog box, 371,
 371–372
 Overconstrained dimensions, Sketch tab, 23
 Overlay views, 339

-
- P**
- Pan command, **10**
 - Panel bars
 - creating new work environment, **26–28, 28**
 - for new drawing, **39**
 - using, **17**
 - paper size, defining templates for, **186**
 - Parallel constraint, **87–89**
 - parameters, iPart, **287–289**
 - parametric modeling
 - concept of, **82–83**
 - defined, **81**
 - introduction to sketching, **83–84, 84–86**
 - modifying part with dimensions, **107–108**
 - parent views
 - adding features, **82**
 - creating auxiliary views, **48–49**
 - creating projected views, **44–45**
 - defined, **40**
 - part dimensions
 - Hole tables, **219–222, 220–222**
 - Ordinate Dimension Set tool, **218–219, 219**
 - part fade, animating, **386–387, 386–387**
 - Part Features tools
 - applying work features, **121**
 - Chamfer tool, **134**
 - drawing view associativity, **72**
 - Hole feature, **115**
 - Parameters tool, **288**
 - Revolve tool, **132**
 - part modeling
 - adding sketch dimensions, **89–94, 91–92, 94**
 - applying Hole feature, **113–120, 116–120**
 - applying work features, **120–129, 122–128**
 - introduction to sketching, **83–86, 84–86**
 - keyboard shortcuts, **395**
 - overview of, **81**
 - parametric modeling concept, **82–83**
 - sketch constraints. *see* sketch constraints
 - sketching, **84–86**
 - using Extrude tool, **103**
 - using feature libraries, **134–136, 135**
 - using Fillet tool, **108–113, 111–112**
 - using Revolve tool, **129–134, 129–134**
 - part modeling, advanced, **229–292**
 - beginning new part, **230–232, 231**
 - Coil tool, **274–278, 274–278**
 - Emboss tool, **240–243, 240–243**
 - iParts, **286–292, 288–291**
 - Loft tool. *see* Loft tool
 - Mirror tool, **278–284, 278–284**
 - rectangular and circular patterns, **244–245, 244–245**
 - Rib and Web tools, **266–267, 266–267**
 - Sculpt tool, **256–261, 256–261**
 - Shell tool, **262–265, 262–266**
 - Spline tool, **245–246**
 - Split tool, **238–239, 238–240**
 - Sweep tool, **268–271, 268–271**
 - Thicken/Offset tool, **284–286, 284–286**
 - Thread tool. *see* Thread tool
 - Part tab, Application Options dialog, **25**
 - parts. *see* sheet metal parts
 - parts list
 - changes reflected in, **226**
 - documenting iAssembly, **326–327**
 - placing in drawing, **222–223, 223**
 - Perpendicular constraint, **87, 92**
 - perspective, **15–16, 384**
 - Place Component tool, **142–143, 142–143, 324**
 - Place Constraint tool, **139–141, 139–141**
 - Place Feature tool, **135–136**
 - Place From Content Center tool, **158–160, 164**
 - placed features, **82**
 - Placement options, Hole dialog box, **113**
 - Placement tools, Shaft Component Generator, **307**
 - Positional representation tool
 - creating positional representation, **336–338, 336–338**
 - defined, **336**
 - detailing using, **338–339, 338–339**
 - overview of, **153**
 - Precision setting, Baseline Dimension Set tool, **65**
 - Predict Offset and Orientation checkbox, Place Constraint tool, **139**
 - preferences, Style and Standard Editor, **174–176, 175**
 - presentations
 - creating, **77–78, 78**
 - creating exploded view, **331–336, 332–335**
 - keyboard shortcut, **396**
 - overview of, **78, 331**
 - Preserve All Features, Fillet dialog box, **110**
 - Preset Value settings, Style and Standard Editor, **174**
 - previewing, assembly constraints, **139, 145**
 - Profile option, Break Out dialog, **203**
 - Project File, display by, **5–6**

Project File editor, 29, 29
 project files
 creating, 31–34, 32–33
 manager buttons, 30–31
 overview of, 28–29, 29
 rules for, 29
 settings, 30
 types of, 29–30, 32
 Project Flat Pattern tool, 362–363
 Project Geometry tool
 adding bolts manually, 158
 adding hem, 362–363
 applying work features, 123
 creating slice view, 200
 sketching layout, 247
 projected view
 creating, 44–48, 45–47
 creating assembly drawing, 74
 removing break inheritance from
 isometric, 198–199
 Projection Type tool, 175
 Projects dialog box, 171
 Propagate to Parent View option, Break
 dialog box, 197
 properties
 applying to work features, 128–129
 dimension, 211–213, 212–213
 editing title block text, 189–190
 view sketching, 202
 publishing, sheet metal rules, 349–350,
 349–350
 Punch tool, 365–366, 365–366

R

radius dimensions, 62–63, 63
 Realistic rendering
 defined, 371
 setting up basic, 373–374, 374–375
 Style tab options for, 372, 372
 Record Animation button, 387–389
 Recover, Help system, 34
 Rectangular Pattern tool, 244–245, 244–245
 Redo, 10
 Reflection Environment, Colors tab, 21
 reflection, scene styles, 379
 Relative Angle, rotate view by, 50–51, 51
 Render Animation dialog box, 388, 388
 Render Image dialog box, 388

Render Image tool. *see* renderings, creating
 renderings, creating, 370–376
 of animations. *see* animation, Inventor
 Studio
 General tab, 370–371, 371
 Illustration, 376, 376
 Output tab, 371, 371–372
 scene styles, 376–381
 setting up basic, 373–375, 374–375
 Style tab, 372–373, 372–373
 surface styles, 381–382, 381–383
 representations
 assembly modeling using, 153–156, 155
 creating View, 154–156, 155
 types of, 153–154
 resizing, dialog boxes, 3, 3
 resources
 animation, 383
 Autodesk, 399–400
 Autodesk Labs, 399
 Design Accelerators, 274
 Retrieve Dimensions tool, 70–71, 70–71
 Return button, 10
 Revision Table tool and Tag, 215–217,
 216–217
 Revolve tool, 129–134
 creating turned part with, 130–134,
 130–134
 Extents options, 129–130
 overview of, 129, 129
 Rewind tool, 14, 14
 Rib tool, 266–267, 266–267
 Rotate Component tool, 319–320, 323
 Rotation assembly constraint, 141, 148
 Rotation-Translation assembly constraint, 141
 rotation, view, 50–53, 51–53
 rules. *see* sheet metal rules

S

scale
 creating auxiliary views, 48
 creating base views, 41–42
 creating break view, 197
 creating detail views, 75–76
 creating quick start template file, 192
 creating sheet metal drawings using, 367
 creating simple assembly drawing, 74
 editing layer style, 182

- General tab, Style and Standard Editor, 174
- placing parts list in drawing, 222
- presentation views, 78
- rotating views, 52
- Scale tool, **264–265**
- scene styles, 376–381
 - Background tab, 377, **377–378**
 - building, **379–381**, 380–381
 - defined, 371
 - Environment tab, 378, **378–379**
 - overview of, 376, **376–377**
 - setting up basic rendering with, 374–375, **374–375**
- Sculpt tool, 256–261
 - adding advanced fillets, 259–261, **259–261**
 - creating solid from space, 257–258, **257–258**
 - overview of, 256, **256**
- section lines, **53–55**
- Section View dialog, 199
- section views
 - assembly drawing with, 75
 - centerline bisector for, 59
 - creating, **53–55**, 54–55
 - slice view vs., **199**
 - specifying hatch pattern using, **177–178**, 178
 - view associativity with, 73
- Sections menu, Shaft Component Generator, 307
- Select Member dialog box, 327
- Select Other tool, 363
- selected views, 44
- Selection, Application Options dialog box, 20
- Selections group, Place Constraint tool, 141
- Shaded Display modes, Application Options dialog box, 22
- Shaded Display option, **15**
- shadows
 - creating, **15–16**
 - scene styles, **379**
- Shaft Component Generator, 306–314
 - creating shaft, **307–312**, 308–312
 - Design tab, 306, **306–307**
 - editing shaft, **312–314**, 313–314
 - Graphs tab, **307**
 - overview of, **306**
- Shape tab, Flange tool, **352–353**
- Sheet Formats, **191–192**
- Sheet Metal Default dialog box, 342, **342–343**
- sheet metal parts, 341–368
 - with Contour Flange tool, **359–361**, 359–361
 - Cut tool, 364
 - with Cut tool, 364
 - Cut tool, **364**
 - Flange tool, **352–359**
 - Hem tool, **362–363**, 362–363
 - with Hem tool, 362–363
 - making with Face tool, 350, **350–351**
 - making with Punch tool, 365–366
 - manufacturing-focused toolset, **342**
 - with Punch tool, **365–366**
 - rules for. *see* sheet metal rules
 - special detailing tools, **367–368**, 367–368
- sheet metal rules, 342–350
 - creating new rule, 343–344, **343–344**
 - defining, 348, **348–349**
 - overview of, **342**
 - publishing, **349–350**, 349–350
 - Sheet Metal Default dialog box, 342, **342–343**
 - Style and Standard Editor, **344–347**, 347
- Sheet tab, Style and Standard Editor, 344–345
- Shell tab, Shell tool, 262, **262**
- Shell tool, 262–266
 - More tab, **262–263**
 - new sketch for next step, 264–265, **264–266**
 - Shell tab, **262**, 262, 262–265
 - shelling of part, **263**, 263
- Show Reflections, scene styles, 379
- Show Shadows, scene styles, 379
- Simple Drill, Hole dialog box, 114
- Single User project file, **29**
- Size tab, Punch tool, 365, **365**
- sketch constraints, 87, 87–104, 91–92
 - adding dimensions, **89–94**, 91–92, 94, **102–103**, **102–104**
 - building complex part model, **98–102**, 99–101
 - with circles, **237–238**, 238
 - construction geometry, **96–98**, 97
 - overview of, **87–88**
 - specialized linetypes, **95–96**
 - using Revolve tool to create turned part, 132
 - viewing existing, 88, **88–89**
 - working with, **84–86**

- Sketch Constraints menu, **87, 87**
- sketch-derived views, 196–210
 - break out view, **203–207**
 - component overrides, *207–208*, **207–208**
 - creating break view, **197–199**
 - cropped views, *209–210*, **209–210**
 - defining break view, *196*, **196–197**
 - expanding dimensions. *see* dimensioning, expanded
 - overview of, 196
 - sketching, *201–203*, **201–203**
 - slice view, *199–201*, **199–201**
 - suppressing view, **210**
- Sketch Properties toolbar, **202**
- Sketch tab, Application Options dialog box, **23–25, 24**
- sketched features, **82**
- sketching, 113–120
 - adding bolts manually, 158–159
 - adding constraints. *see* constraints
 - adding dimensions, **89–94, 91–92, 94, 102–103, 102–104**
 - adding text to part, **240–243**
 - creating slice view, *199*, **199–201**
 - with Fillet tool, *108*, **108–113, 111–112**
 - with Hole feature, **113–120**
 - keyboard shortcuts, **395**
 - layout, **247–248**
 - parametric models, **82–83**
 - part models, **83–86, 84–86**
 - views, **201–203, 201–203**
- slice views, **199–201, 199–201**
- Smooth constraint, **87**
- Snap Settings, General Dimension tool, 62
- Specification tab, Thread tool, **233, 233**
- Spline tool, **245–246**
- Split tool, *238–239*, **238–240**
- Spotface, Hole dialog box, 114
- Spur Gear Component Generator, 314–318
 - adding gears, **316–318, 317–318**
 - Calculation tab, **315–316, 316**
 - Design tab, **315–316**
 - overview of, 314–315, *315*
- standard parts
 - adding bolts manually, **157–163, 158–163**
 - using Bolted Connection Design
 - Accelerator, **163–167, 164–167**
 - working with, **157**
- Standard toolbar. *see* Inventor Standard toolbar
- standards and styles
 - changing style settings. *see* Style and Standard Editor dialog box
 - creating new standard, **170–173, 171–173**
 - drawing templates. *see* templates, drawing overview of, **169–170**
 - saving new standard for sharing, **183–185, 184**
- Start-up Action, Application Options dialog box, 20
- Start-up, Application Options dialog, 20
- status bar, *18, 18*
- Status dialog box, **303–304**
- Steering Wheels, Inventor Standard toolbar, **13–14**
- Style and Standard Editor dialog box
 - Available Styles tab, 176
 - Bend tab, **345–346, 346**
 - Corner tab, *347, 347*
 - creating new dimension style, *179, 179–180*
 - creating new standard, **172–173**
 - editing layer's style, **180–183, 181–183**
 - General tab, **173–174, 174**
 - Material Hatch Pattern Defaults tab, **177–178, 178**
 - Object Defaults tab, *176–177, 176–177*
 - sheet metal rules, **344–347, 347**
 - Sheet tab, **344–345**
 - View Preferences tab, **174–176, 175**
 - working with object defaults, *178, 178–179*
- style settings. *see also* Style and Standard Editor dialog box
 - assembly drawings, **74**
 - base views, **42**
 - break views, **196–197**
 - dimensions, 65, 71
 - folder options for, **30**
 - Hole tables, 221
 - presentation views, **78**
 - Rewind tool, **14**
 - rotating views, **51–52**
 - scene, **376–381**
 - sheet metal rules as. *see* sheet metal rules
 - style library, **30, 184**
 - surface, *381–382, 381–383*
- Style tab, Render Image dialog box, **372–373, 372–373**
- styles, defined, 170
- suppressing views, **210**
- surface styles, *381–382, 381–383*

surface texture callouts, *215, 215*
 Surface Texture Symbol tool, *222–226*
 Sweep tool, *268–271, 268–271, 274*
 Symbols options, Break dialog box, *197*
 Symmetric constraint, *87*

T

Table tool, *367–368*
 tabs, dialog box, *2, 2*
 Tangent Arc tool, *246*
 Tangent Circle tool, *246*
 Tangent constraint, *87, 140, 140*
 Taper Tapped, Hole dialog box, *115*
 Tapped Hole, Hole dialog box, *114*
 templates
 beginning new drawings from, *38–40, 38–40*
 New File dialog box, *7–8, 8*
 templates, drawing, *184–193*
 building new template, *185–186, 186*
 creating quick start template file, *191–193, 191–193*
 creating template file, *191, 191*
 modifying title block, *187–190, 187–190*
 overview of, *184*
 updating standard, *187*
 termination options, Emboss tool, *240*
 text
 describing revision tables, *217*
 dimension, *62–63*
 dimension editing tools, *65–67*
 previewing patterned, *245*
 text, standards and styles settings
 Available Styles tab, *176*
 creating new dimension style, *180*
 modifying title block, *187–190, 187–190*
 Preset Value, *174*
 Text tab, Edit Dimension dialog box, *211–213*
 Text tool
 adding text to part with, *240–242*
 Leader Text tool, *214, 214*
 overview of, *213, 213–214*
 Termination Group, Hole dialog box, *114*
 Thicken/Offset tool, *284–286, 284–286*
 Thread tool, *232–238*
 3D grip editing, *235–237, 235–237*
 adding detail, *233–234, 234*
 controlling 3D grips, *235*
 Location tab, *232–233*

 sketching constraints with circles, *237–238, 238*
 Specification tab, *233, 233*
 three-dimensional Grip
 controlling, *235*
 defined, *234*
 editing, *235–237, 235–237, 320–321, 321*
 three-dimensional models, making, *104–108, 105–108*
 Three Point Arc tool, *246*
 Through All, Hole dialog box, *114*
 timeline, animation, *383–385, 383–385*
 title bar, *8, 8–9*
 title block
 creating quick start template file, *192, 192*
 defined, *185*
 modifying, *187–190, 187–190*
 To option, Hole dialog box, *114*
 Tolerance Method list, dimensions, *211–212*
 Toolbar list, Customization dialog, *290*
 ToolTip Appearance, Application Options dialog box, *20*
 Transition tab, Loft tool, *251, 251, 251*
 Transitional tab, Place Constraint tool, *141, 141*
 Trim command, *248*
 True Reflection option, Realistic rendering, *372, 372*
 Tweak Components tool, *332, 335*
 two-dimensional drawings, from 3D data.
 see 2D (two-dimensional) drawings, from 3D data

U

Undo, *10*
 Units settings, Style and Standard Editor, *174, 179–180*
 Up One Level icon, *4*
 Update Styles, *187*
 Use Reflection Image, scene styles, *379*
 Use Style Library setting, Project File Editor
 creating new standard, *171*
 creating quick start template file, *193*
 defined, *30*
 user interface
 Browser bar, *17*
 Design window, *17*
 Display options, *14–17, 15–16*
 overview of, *8–13, 8–13*
 Panel bars, *17*

Rewind tool, **14**, *14*
 status bar, **18**, *18*
 Steering Wheels, **13–14**
 ViewCube, *13*, **13**

V
Vault

opening from files from, **6**
 project file, **29**, *31*
 resources for Autodesk, **400**

Vertical constraint, **87**, *123*

View Filters, Edit Hole Table dialog, *221*

View Label Defaults tools, Style and Standard Editor, *175*

View menu icon, **4**

View Preferences tab, Style and Standard Editor, **174–176**, *175*

View representations, **153–156**, *155*

ViewCube

adding dimensions, *103*
 animating cameras, *385–386*
 beginning new part, *230*
 Inventor Standard toolbar, **13**, *13*

views

existing constraints, *88*, **88–89**
 keyboard shortcut for drawing, **395**
 overlay, *339*
 sketch-derived. *see* sketch-derived views

views, creating, *38–40*

adding dimensions. *see* dimensions
 adding Hole/Thread Notes, *68–69*, **68–69**
 auxiliary, **48–50**
 base, *40–41*, **40–44**, *43–44*
 detailing, **55–59**
 drawing associativity, *72–73*, **72–74**
 drawing of a part, **38–40**
 presentation, *77–78*, **78**

projected, **44–48**
 retrieving dimensions from, **70–71**, *71*
 rotating, **50–53**
 section, **53–55**

Visual Syllabus, Help system, **34–35**, *35*

W

Web tool, **266–267**, *266–267*

weldments, **339–340**, *340*

Width setting, renderings, *370*

Windows Explorer, **143–144**, *144*

Wireframe display, **15**, **22**

work axis

applying, **121–122**, **125–126**
 defined, **113**, **121**

work environment, creating new, **25–28**,
27–28

work features

applying, **121–128**, *122–128*
 overview of, **120–121**

work plane

applying, **121–124**, *122–123*, **127–128**, *128*
 editing parts in assemblies with, *150–152*,
150–152
 overview of, **120**

work point, **121–123**, *122*

X

X-Ray Ground Shadow tool, **15–16**

XML files, saving settings as, *20*

Z

Zoom All command, **10**, *73*

Zoom command, **10**, *11*

Zoom Selected tool, **12**

Zoom Window tool, **10**