

# INDEX

## Symbols and Numbers

∇ (countersink symbol), 98  
3D Print utility, 42

## A

Activate Component menu option, 50  
Animation workspace, 12, 101  
ANSI (American National Standards Institute), 3, 88  
Arc tool, 19, 40  
ASME (American Society of Mechanical Engineers), 3, 92  
assemblies, 45  
    assembly drawings, 94, 101  
    bill of materials, 102  
    exploded view, 101  
Auto Explode tool, 101  
axis, 34

## B

bill of materials (BOM), 102  
bodies, 46  
boundary edges, 82  
Box tool, 21

## C

CAD (computer-aided design), 4  
CAM (computer-aided manufacturing)  
    software, 5  
CAM workspace, 12  
centerlines, 93, 97  
center marks, 93, 97  
center rectangle, 22  
Chamfer tool, 22, 37  
Change Parameters menu option, 31, 55  
Circle tool, 19  
CNC (computer numerical control), 12  
Coil tool, 21, 73–75  
coincident constraint, 34

Component Browser, 13  
components, 45, 46, 49  
computer-aided design (CAD), 4  
computer-aided manufacturing (CAM)  
    software, 5  
computer numerical control (CNC), 12  
constraints, 18, 22, 34  
construction geometry, 15  
Construction menu, 49  
construction plane, 47–49  
Countersink option, 57  
countersink symbol (∇), 98  
Create Components from Bodies menu  
    option, 49  
Create Sketch tool, 18, 22  
cut extrude, 28, 37  
Cylinder tool, 21

## D

decal, 15  
Design History Timeline, 13, 28  
dimensioning, 97–99  
dimensions, 24  
Display Settings menu, 66  
drafting, 2–3, 87, 88–89  
    assembly drawings, 94  
    bill of materials, 102  
    exploded view, 101  
    dimensioning, 97–99  
    line types, 93  
        centerlines, 93, 97  
        center marks, 93, 97  
        regular-interval dashed lines, 93  
        solid lines, 93  
    part drawings, 94–95  
    projection angle, 90–92  
    scale, 89–90  
    size, 89  
    text, 99–101  
    tolerance, 92–93  
    views, 95–97

draftspeople, 2  
drawing scale, 89–90  
drawing size, 89  
Drawing workspace, 12, 95

## E

Edit Feature, 29  
exploded view, 101  
Extend tool, 19  
Extrude tool, 20, 25

## F

features, 8–9. *See also* Tools  
    initial features, 19–21  
    modifying features, 21–22  
Fillet tool, 19, 22, 26–27  
First Angle Projection, 90, 91  
fix constraint, 67  
Fusion 360, 6, 7  
    features, 8–9  
    installation, 10–11  
    interface, 13–14  
    main toolbar, 14–16  
    Project Browser, 11  
    workspaces, 9–10, 11–16  
        Animation, 12, 101  
        CAM, 12  
        Drawing, 12, 95  
        Model, 12. *See also* Model  
            workspace  
        Patch, 12, 80  
        Render, 12, 105  
        Simulation, 12

## G

Ground menu option, 52  
guide rail, 70

## H

Hole tool, 20, 57–59

## I

Insert Symbol tool, 98  
International Organization for  
    Standardization (ISO), 3, 92  
Intersect operation, 40  
isometric view, 97

## J

joints, 46, 52

## L

Line tool, 18  
line types  
    centerlines, 93, 97  
    center marks, 93, 97  
    regular-interval dashed lines, 93  
    solid lines, 93  
Loft tool, 62–64, 65

## M

Make menu, 42  
mechanical engineering, 5  
mesh modeling, xviii–xix  
modeling  
    20-sided die, 78–84  
    assemblies, 45  
    coils, 73–75  
    complex curves, 61  
        Loft tool, 62–64, 65  
        Sweep tool, 62–64, 66  
    components, 45, 46, 49  
    constraints, 18, 22, 34  
    cubes, 22–28  
    Design History Timeline, 28  
    dimensions, 24  
    hinge, 53–60  
    hollow box, 46–52  
    joints, 46, 52  
    mesh modeling, xviii–xix  
    organic shapes, 64  
    parameters, xviii, 7  
    parametric modeling, xviii–xx  
    pencil holder, 38–42  
    reference geometry, 14, 35, 47  
    robot arm, 115  
    screws, 73, 75–78  
    solid modeling tools, 12, 13. *See also*  
        Model workspace  
    spheres, 34–38  
    springs, 73  
    teapot, 64–71  
Model Parameters section, 31, 55  
Model workspace, 12  
    Component Browser, 13  
    Design History Timeline, 13, 28  
    interface, 13–14  
    main toolbar, 14–16

- origin, 14
- Ribbon toolbar, 13
- View Cube, 13, 14
- viewport, 14

Modifying features, 21–22

## N

- Navigation toolbar, 14
- New Body operation, 36
- nominal dimensions, 92
- numerical control (NC), 4

## O

- Offset Plane tool, 47, 66
- Offset tool, 19
- ordinate dimensions, 99
- origin, 14, 22
- Output menu, 101
- overlap, 40

## P

- parameters, xviii, 7
- parametric modeling, xviii–xx
- part drawings, 94–95
- part properties, 101
- Patch tool, 82
- Patch workspace, 12, 80
- Physical Material menu option, 94
- Pipe tool, 21
- pitch, 74
- Plane Along Path tool, 67
- Plane Through Three Points, 80
- Polygon option
  - circumscribed, 77
  - inscribed, 77
- profile, 25
- Projected View tool, 96
- projection angle, 90–92
  - First Angle Projection, 90, 91
  - Third Angle Projection, 90, 91
- projects, 11

## R

- Rectangle tool, 18
- reference geometry, 14, 35, 47
- regular-interval dashed lines, 93
- rendering, 103

- Restore Defaults menu option, 16
- revision, 101
- revolved cut, 78
- Revolve tool, 20, 33–36
- Ribbon toolbar, 13

## S

- Scale tool, 84
- screws, 73, 75–78
- Sheet Size setting, 95
- Shell tool, 18–19
- Sketch Dimension tool, 19
- sketches, 9
- Sketch tools, 18–19
- solid lines, 93
- solid modeling tools, 12, 13. *See also*
  - Model workspace
- Sphere tool, 21
- Split Body tool, 47
- springs, 73
- Stitch tool, 82
- surface modeling features, 12
- surfaces, 73, 78, 82
- Sutherland, Ivan, 4
- Sweep tool, 62–64, 66

## T

- tangency, 63
- technical drawings, 1–3, 87–89. *See also*
  - drafting
- Text tool, 85
- Third Angle Projection, 90, 91
- Thread tool, 73, 75–78
- title block, 89, 100
- tolerance, 51, 92–93
  - tolerance stacking, 99
- Tools, 17
  - Arc, 19, 40
  - Auto Explode, 101
  - Box, 21
  - Chamfer, 22, 37
  - Circle, 19
  - Coil, 21, 73–75
  - Create Sketch, 18
  - Cylinder, 21
  - Extend, 19
  - Extrude, 20
  - Fillet, 19, 22, 26–27
  - Hole, 20, 57–59

## Tools (continued)

- Line, 18
- Loft, 62–64, 65
- Offset, 19
- Offset Plane, 47, 66
- Patch, 82
- Pipe, 21
- Plane Along Path, 67
- Projected View, 96
- Rectangle, 18
- Revolve, 20, 33–36
- Scale, 84
- Shell, 22, 42, 50
- Sketch Dimension, 19
- Sketch tools, 18–19
- Sphere, 21
- Split Body, 47
- Stitch, 82
- Sweep, 62–64, 66
- Text, 85
- Thread, 73, 75–78
- Torus, 21
- Trim, 19, 35

## U

- User Parameters section, 31

## V

- View Cube, 13
- viewport, 14
- Visual Style menu, 66

## W

- workspaces, 9–10, 11–16
  - Animation, 12, 101
  - CAM, 12
  - Drawing, 12, 95
  - Model, 12. *See also* Model workspace
  - Patch, 12, 80
  - Render, 12, 105
  - Simulation, 12

## Z

- zero point, 25