

MODULE

3

BASIC DESIGN: THEORY OF SHAPES

Objective:

- Provide an understanding of orthographic projections

Prerequisites:

- Intro to 3D printing
- Drafting equipment, media and reproduction
- Basic drafting
- Introduction to computer aided design (CAD)/2D-3D Skills

Assignment #1: *Demonstrate understanding of normal surfaces*

1. Choose one part from figures 1-5, and create a 3D CAD file of the part. Convert the CAD file to an STL file.
2. Send the file to the 3D printer and print the part.
3. Measure and record key dimensions identified in figures 1-5.
4. Compare to orthographic views from page 32

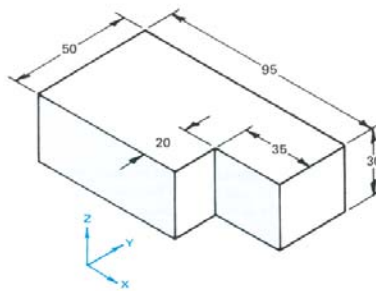


Figure 1: Stop Block

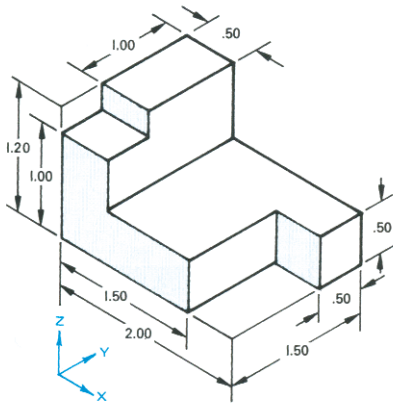


Figure 2: Angle Bracket

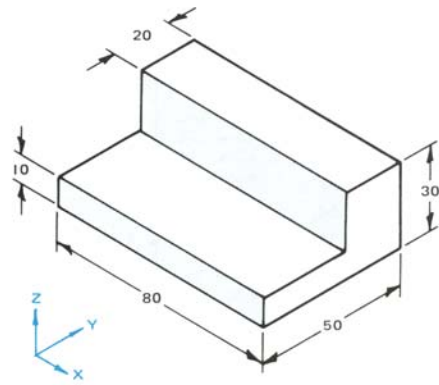


Figure 3: Step Block

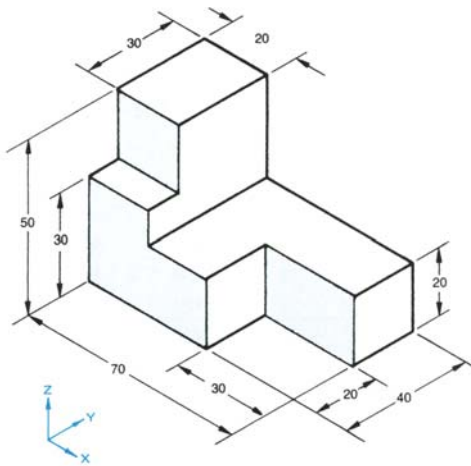


Figure 4: Corner Bracket

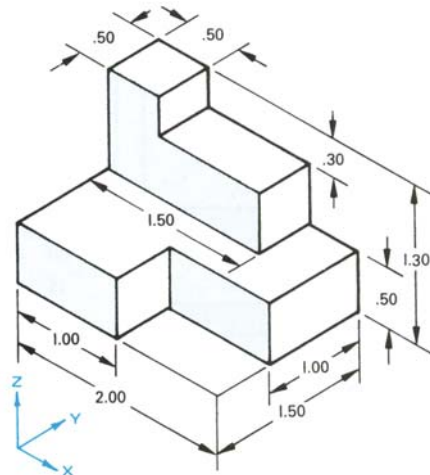


Figure 5: Locating Block

Assignment #2: *Demonstrate understanding of centerlines, circles and arches*

1. Choose one part from figures 6-11, and create a 3D CAD file of the part. Convert the CAD file to an STL file.
2. Send the file to the 3D printer and print the part.
3. Measure and record key dimensions identified in figures 6-11.
4. Compare to orthographic views from page 32

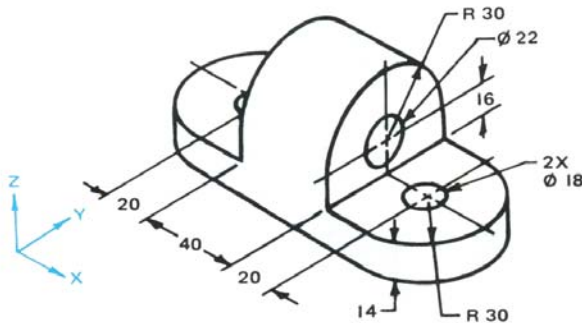


Figure 6: Pillow Block

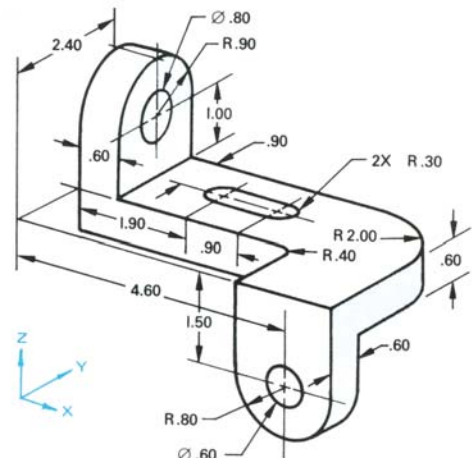


Figure 7: Guide Bracket

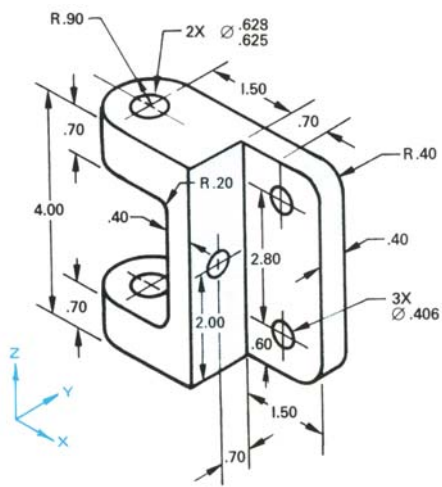


Figure 8: Hinge Fixture

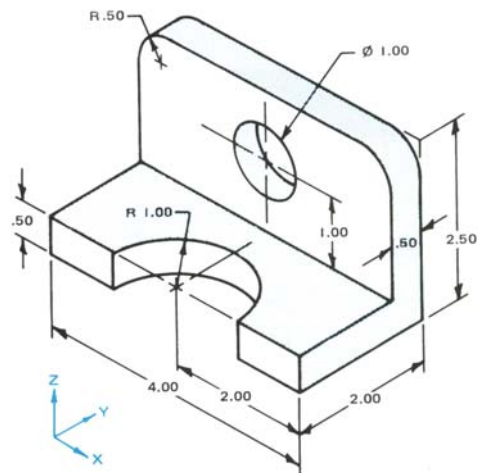


Figure 9: Rod Support

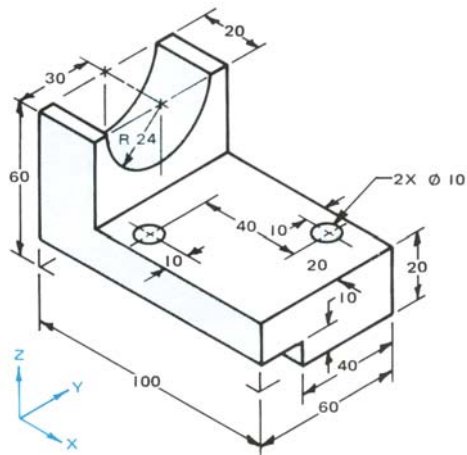


Figure 10: Cradle Support

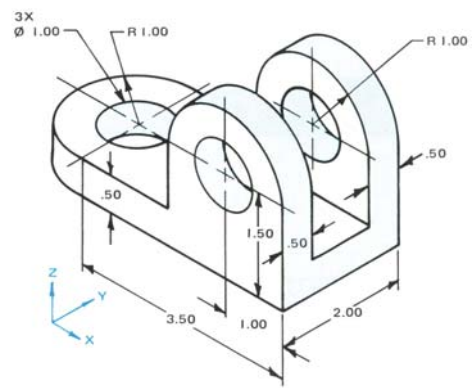


Figure 11: Rocker Arm

Assignment #3: *Demonstrate understanding of slopes and angles*

1. Choose one part from figures 12 and 13, and create a 3D CAD file of the part. Convert the CAD file to an STL file.
2. Send the file to the 3D printer and print the part.
3. Measure and record key dimensions identified in figures 12 and 13.
4. Compare to orthographic views from page 32

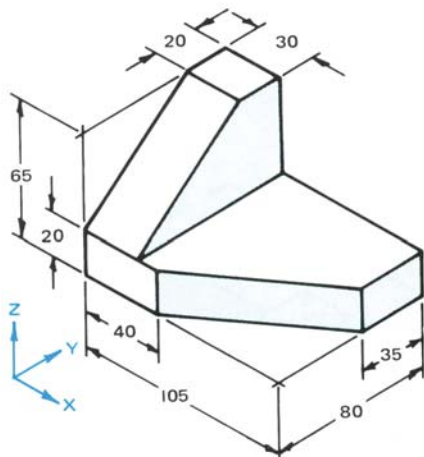


Figure 12: Angle Plate

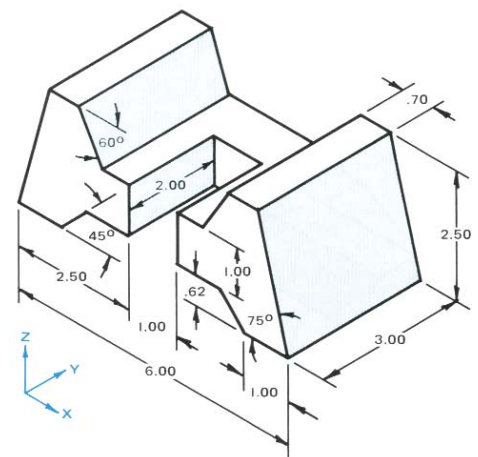


Figure 13: Stand

Orthographic Views

Use figures 1-13 to complete #4 on assignments 1,2,3 of this section.

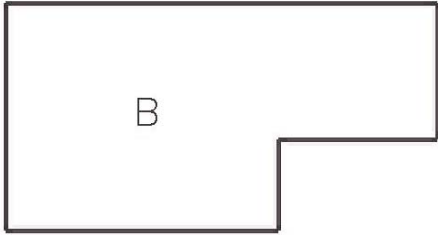


Figure 1 Step Block

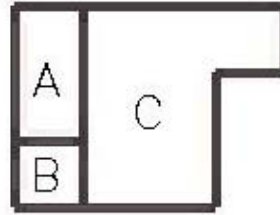


Figure 2 Angle Bracket

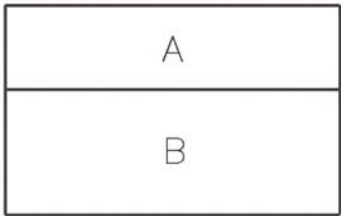
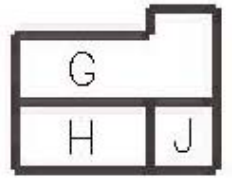
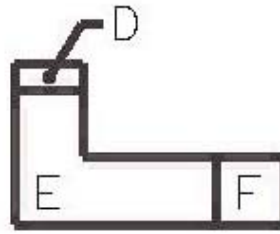
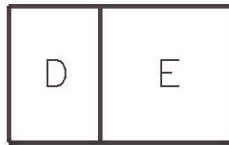


Figure 3 Step Block

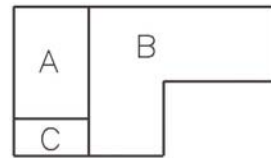


Figure 4 Corner Bracket

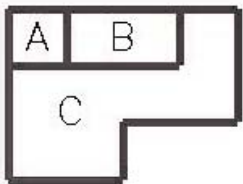
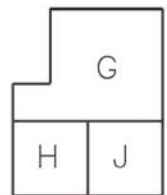
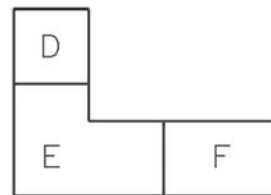
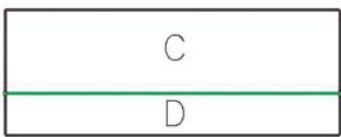


Figure 5 Locating Block

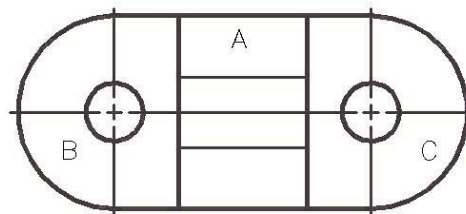
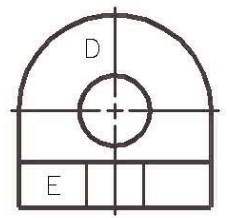
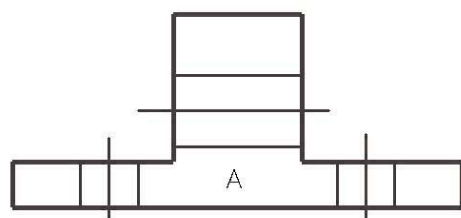
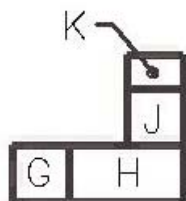


Figure 6 Pillow Block



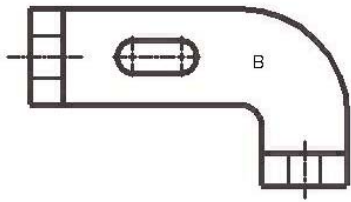


Figure 7 Guide Bracket

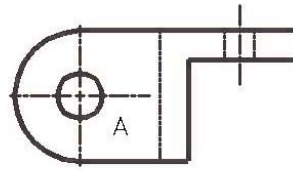
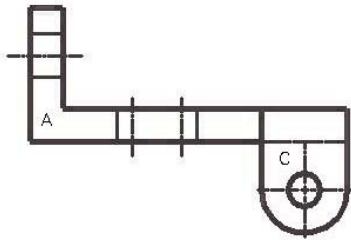


Figure 8 Hinge Fixture

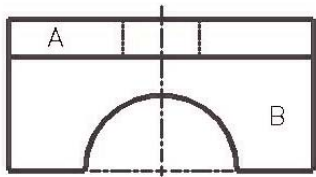
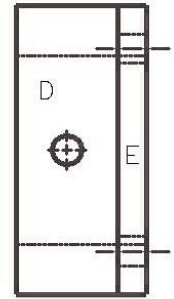
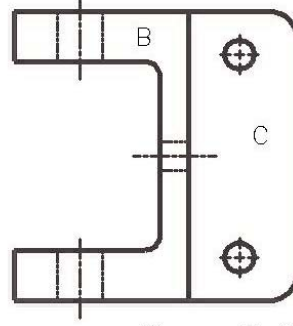


Figure 9 Rod Support

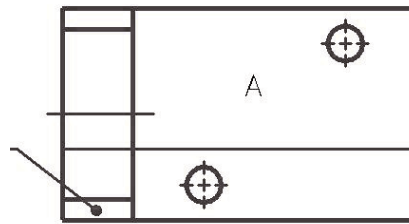
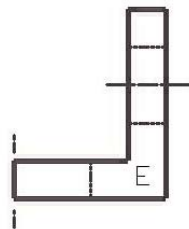
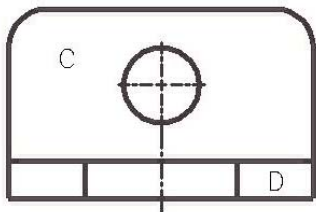


Figure 10 Cradle Support

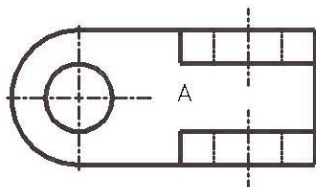
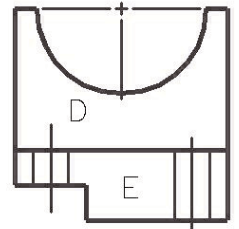
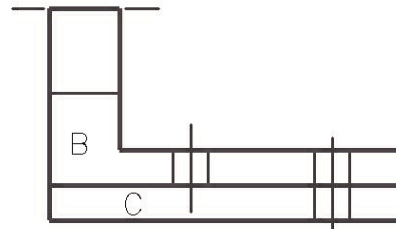


Figure 11 Rocker Arm

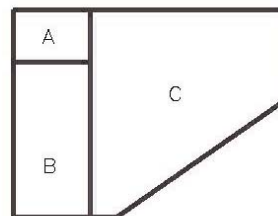
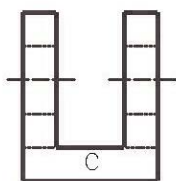
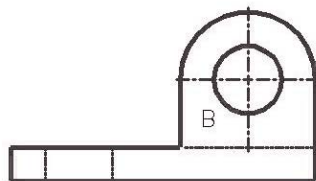
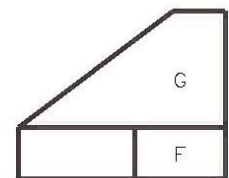
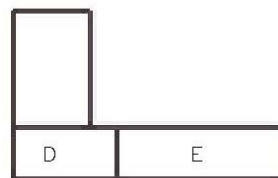


Figure 12 Angle Plate



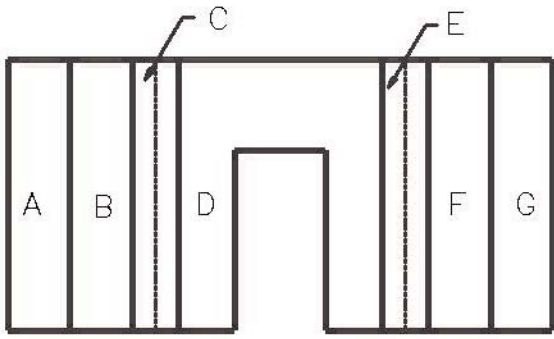


Figure 13 Stand

