

Exercise #1
Due April 14, 2005, 5pm.

Objectives: This lab exercise is intended to help you learn to use the following AutoCAD commands:

- Object Generation: line, arc, circle
- Object Editing: mtext, erase
- Construction techniques: osnap
- AutoCAD navigation tools: absolute, relative and polar coordinates
- AutoCAD file management: creating and using templates, creating layers in a drawing, switching between paper and model space, using viewports

Files to download: cee498.dwt (downloaded from the class website:
<http://www.hitl.washington.edu/people/amlan/cee498/node2.html>)

Download the autocad template file cee498.dwt and use this file to create the drawings for this lab. You will probably want to save the file twice to generate the two different drawings below. Create two new files, one in which you will draw the plot plan in Figure 1 and one in which you will draw the level crank in Figure 2. Don't include dimensions, do include center-lines drawn on a center-line layer.

Drawing #1

You will need to use the AutoCAD commands line and arc to generate this drawing. You will need to use relative, absolute and polar coordinates to generate this drawing.

Step #1 – set the units on the drawing to engineering or architectural – why do we need to do this?

Step #2 – create an appropriate number of layers for the drawing, how many do you need / want?

Step #3 - write down the steps you will take to generate the drawing, try to minimize the number of calculations that you need to make and **DO NOT MAKE ASSUMPTIONS** about the locations of intersection points or angles.

Step #4 – create the drawing, working in Model Space

Step #5 – go to layout #1, edit the text on the template (remember this is in Paper Space), choose an appropriate scale, scale the drawing correctly and print.

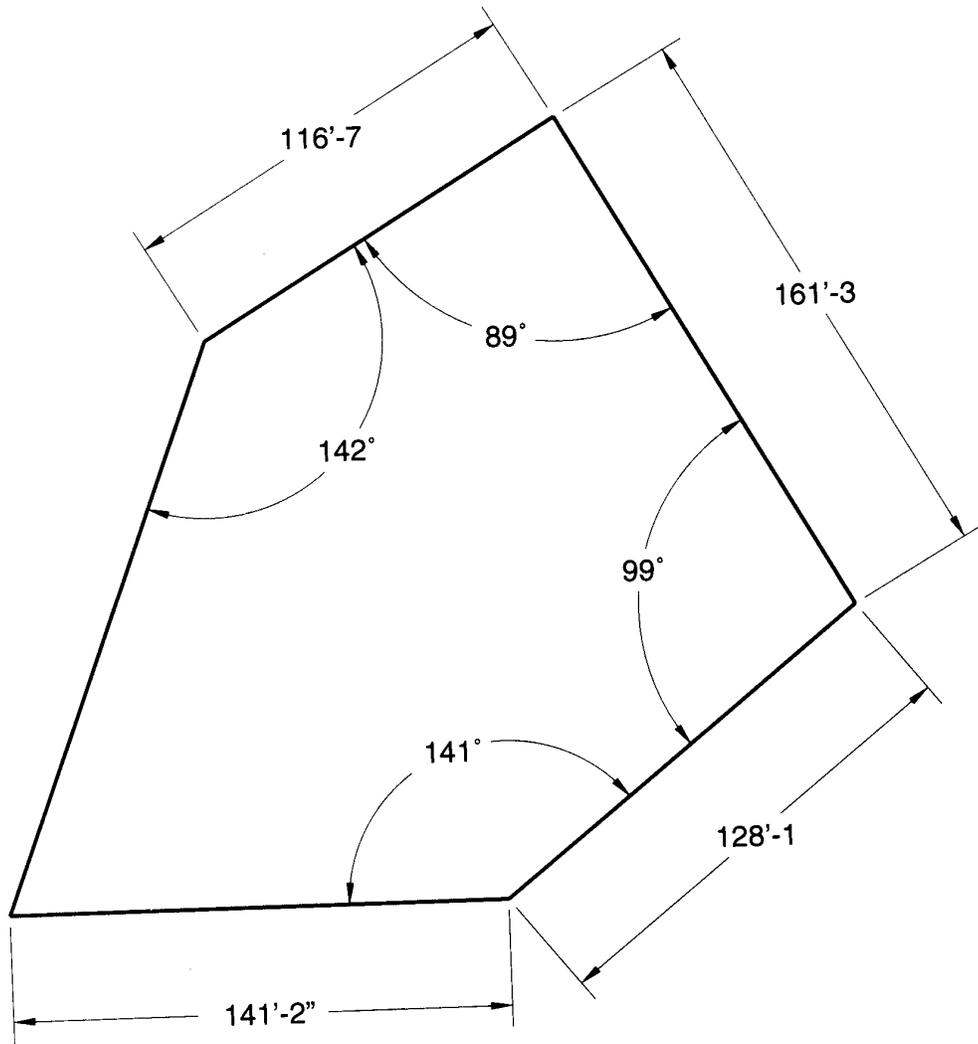


Figure 1: Plot Plan

Drawing #2

You will need to use the AutoCAD commands line, arc and circle to generate this drawing. You will need to use relative and absolute coordinates to generate this drawing.

Step #1 – set the units on the drawing to decimal – why do we need to do this?

Step #2 – create an appropriate number of layers for the drawing. How many do you need / want?

Step #3 - write down the steps you will take to generate the drawing. DO NOT MAKE ASSUMPTIONS about the locations of intersection points, angles or the centers of arcs and circles. Creating the R70 arc is a bit tricky. What exactly are your criteria for creating the arc? HINT: there are a number of places where you will want to draw a circle first and then draw an arc that follows a part of the circle and then erase the circle.

Step #4 – create the drawing, working in Model Space

Step #5 – go to layout #1, edit the text on the template (remember this is in Paper Space), choose an appropriate scale, scale the drawing correctly and print.

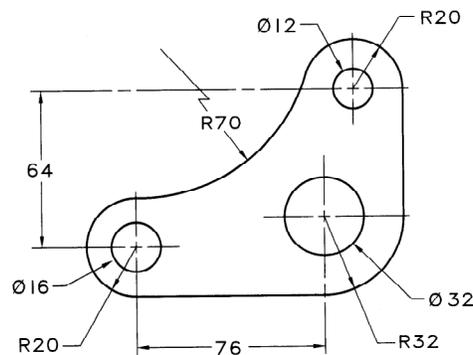


Figure 2: Level Crank
dimensions are in mm

Drawing #3

Draw the following bracket (Figure 3). Do not include dimensions, but do include center-lines as indicated. Dimensions are in mm. Print this at a scale of 1 in = 20 mm.

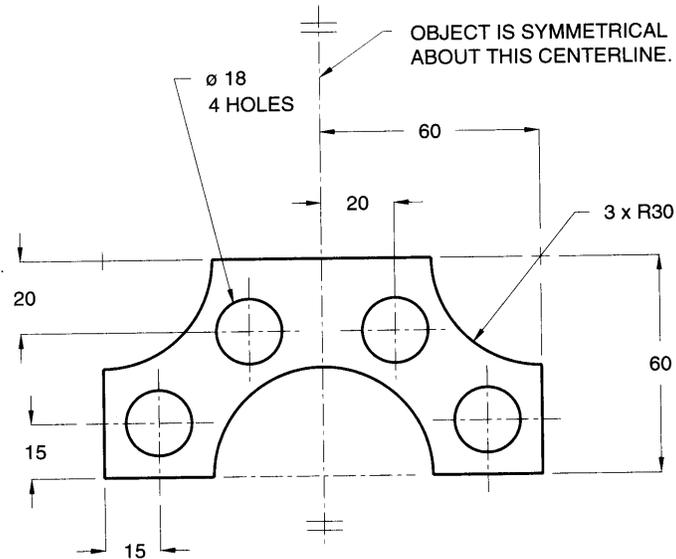


Figure 3

Drawing #4

In this problem you will draw the concrete walkway shown below (Figure 4). You do not need to include dimensions, but you will need to include the centerlines shown.

- List at least four layers that you will include in your AutoCAD drawing file.
- List the steps you will use to create the drawing. The easiest approach is probably to create the centerline first and then to use the OFFSET command to create the two edges of the walkway by creating "offset" copies of the centerline.
- Draw the concrete walkway and print a hard copy. Your hard copy should include only the centerlines and edges of the concrete walkway. Use the do not print option in the layer manager to exclude any construction lines from the printed drawing.

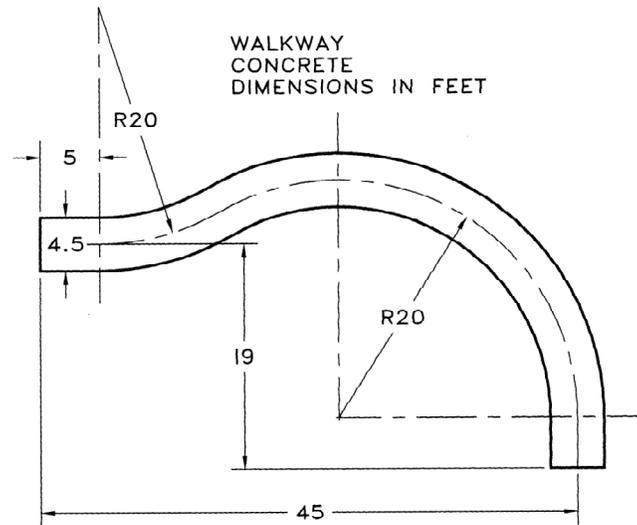


Figure 4.

Drawing #5

In this problem you will draw a concrete foundation for the bike rack shown in the picture below (Figure 5a & b). You need to create two drawings that show the plan view of the foundation and a section through the foundation. The foundation should be a cast-in-place concrete element with the steel tube of the bike rack cast into the foundation. The end of bike rack, which will be cast in the concrete, is shown in Figure 2b. In your drawing, use hatching to distinguish between earth, concrete and steel. You do not need to include dimensions, but your drawing should be to scale. Include the following with your homework solution:

- List all of the layers that you will include in your AutoCAD drawing file.
- List the primary elements included in your AutoCAD drawing file. For example: the hatched region that represents the surrounding earth.
- Draw the foundation and print a hard copy. Use the do not print option in the layer manager to exclude any construction lines from the printed drawing.

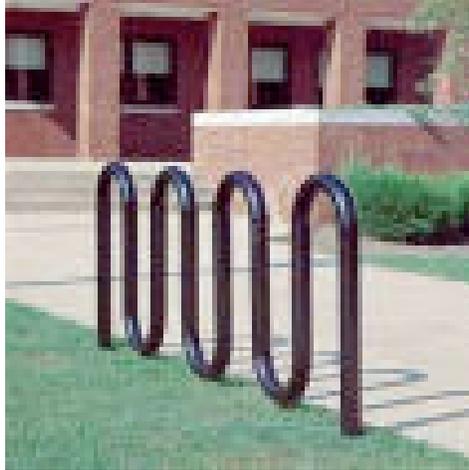


Figure 5a – bike rack

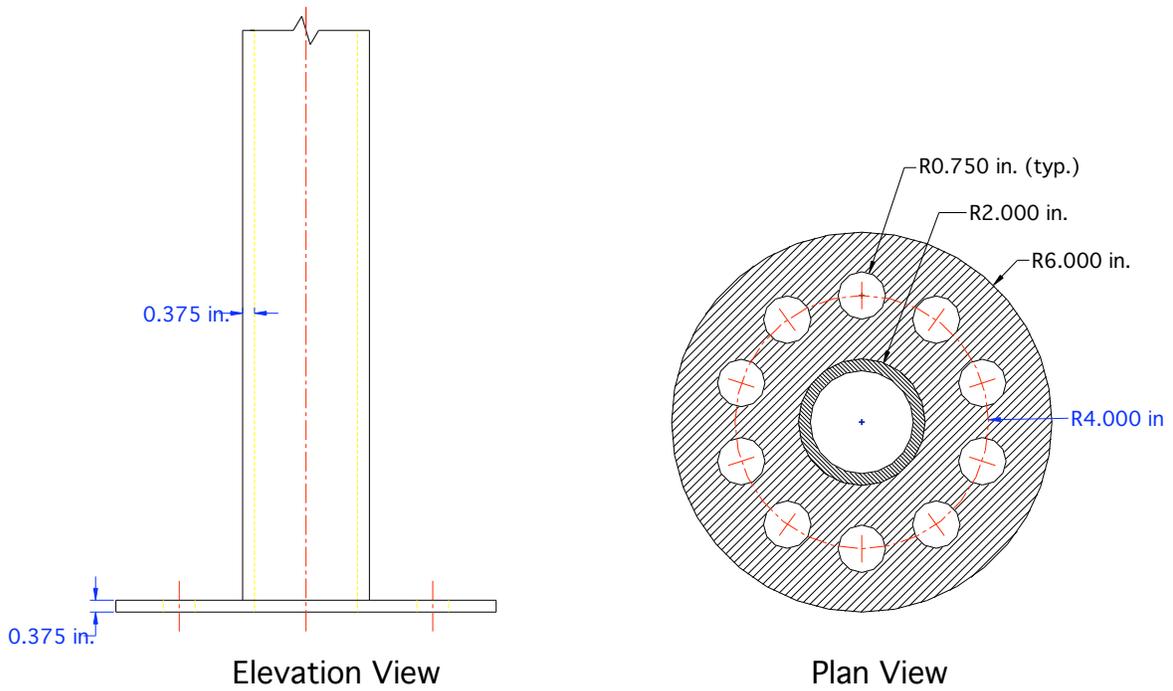


Figure 5b – End of bike rack to be embedded in the foundation