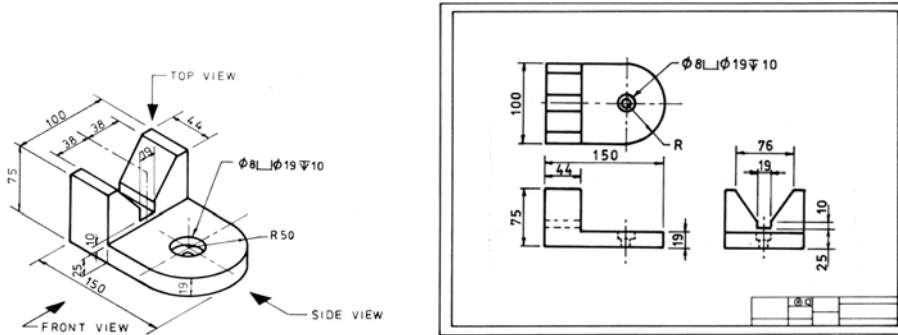


SESSION 2: ORTHOGRAPHIC DRAWING/ SECTIONING

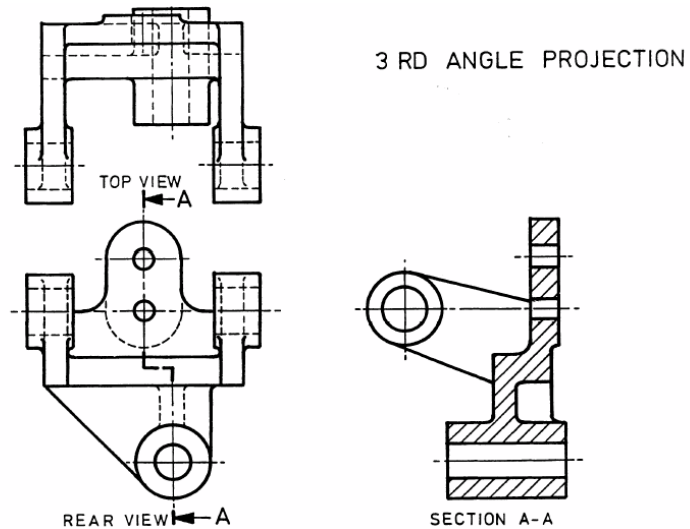
MULTI-VIEW ORTHOGRAPHIC DRAWING

In AutoCAD, if you are working in a 2D-model you must visualize the top, the front, and side views of the object first the draw them. AutoCAD cannot think for you, it just draw as you command.




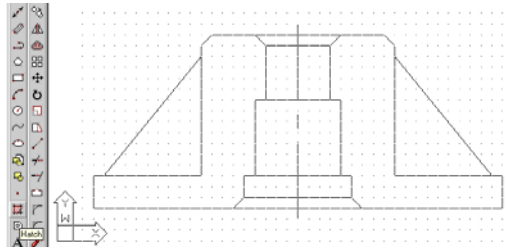
SECTIONING

To draw the sectional view, you need to figure out how the section going to look like ... and draw it. AutoCAD does not think for you but it can help you HATCH the section.

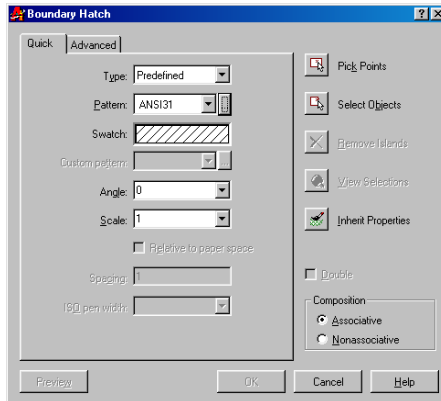


Here is how to HATCH

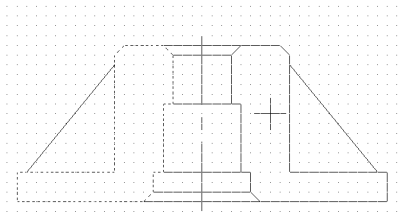
1. Have your sectional drawing ready.
Click on the hatch button 
(or type BHATCH)



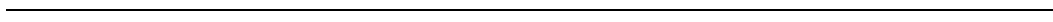
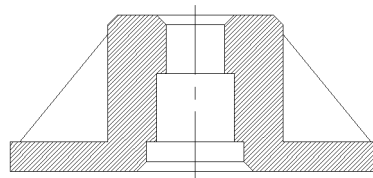
2. You'll see the dialog box. Choose the pattern.
(for steel, select ANSI31)
3. Click on the "Pick Point" button



4. Click inside the area that you want to hatch.

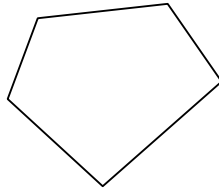


5. Finish!




A NOTE ON LINE AND POLYLINE.


Line and Polyline are different, see the following

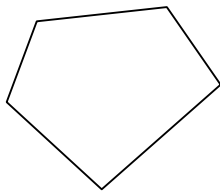


If this polygon is drawn with `LINE`, there will be 5 individual line objects. Not much to do with it... but...

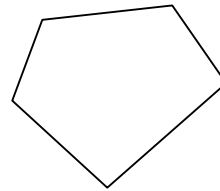
They can be converted into a polyline using `PEDIT`.

If this polygon is drawn with polyline (`PL`, ) it is considered one object.

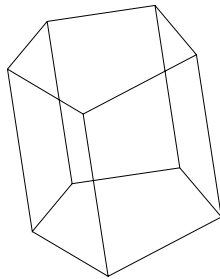
We can `HATCH` () to find the enclosing `AREA` and the perimeter, `EXTRUDE` or `REVOLVE` to make a 3D solid object.



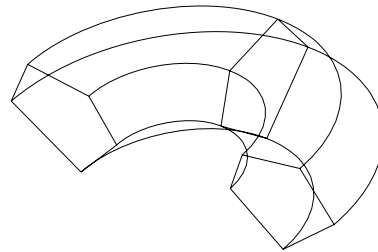
Command: `HATCH`



Command: `AREA`
Area = 5784.8133, Perimeter = 293.6013



Command: `EXTRUDE`



Command: `REVOLVE`

Example: If the trip catch in Plate 10 is made of 3 mm thick steel sheet. Find its weight. (density of steel is 7850 kg/m³)

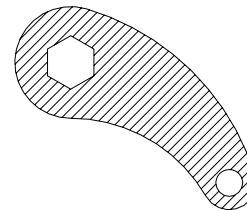
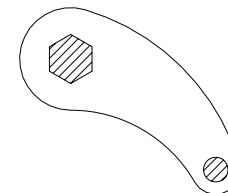
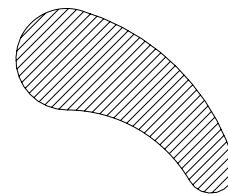
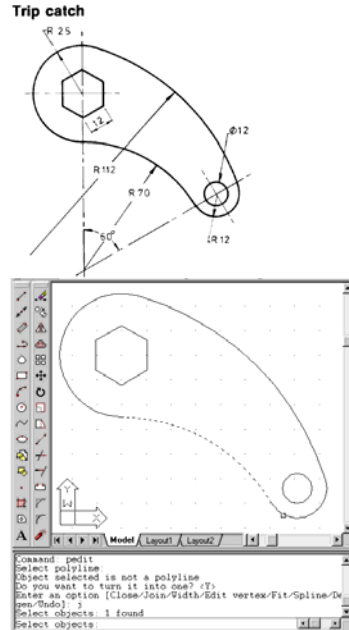
Solution: There are many ways to solve this, but the simplest is the following:

1. Draw it in AutoCAD
2. Turn the perimeter into one polyline using PEDIT with the JOIN option

3. Use the command AREA with the Object option to find the area inside the polyline.
Area = 4644.5012, Perimeter = 304.3952

4. Find the area of the hexagon
Area = 373.9570, Perimeter = 71.9840
5. Find the area of the circle
Area = 113.0973, Circumference = 37.6991

6. Now use the calculator.
The neat area is
 $4644.5012 - 373.9570 - 113.0973 = 4157.4469 \text{ mm}^2$
The volume is
 $[4157.4469 \text{ mm}^2] * [3 \text{ mm}] = 12472.3407 \text{ mm}^3$
The weight is
 $[12472.3407 \text{ mm}^3] * [7.850 * 10^{-3} \text{ grams/mm}^3]$
 $= 97.9 \text{ grams} = 0.1 \text{ kg (approx.)}$



Instruction:

- Read Chapter 10.
- Construct a multi-view drawing using third angle projection:
 - Draw view A as front view
 - Draw the left side - sectional view B-B
 - Draw the top view.
- Use Metric system.
- Provide complete dimensions on a separate layer using blue color.
- Save the drawing to the floppy disk. Name the file with your ID and plate number.
Example: 503356781_CAD2.dwg

