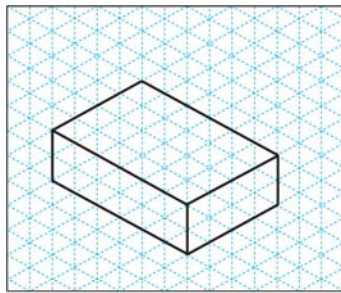


Engr 210 – Engineering Graphics
Lab #4 – Orthographic Projections: Part 1

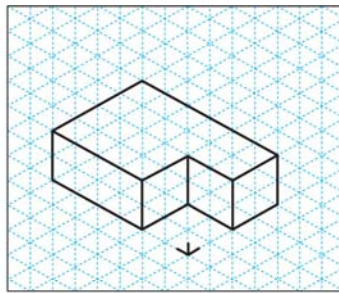
This exercise will develop facility in visualizing three-dimensional objects, creating traditional orthogonal views, creating multiple layers in a drawing and moving entities from one layer to another. Review the rules for creating multi-view projections.

1. Multiview Sketching:

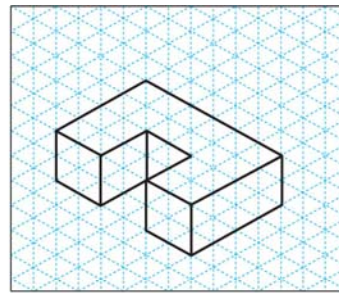
For each object shown as a pictorial, sketch the front, top and right views.



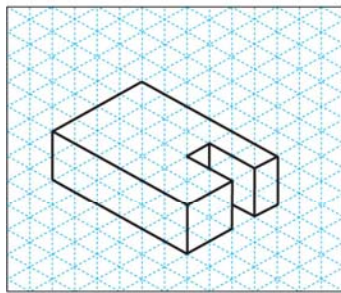
(1)



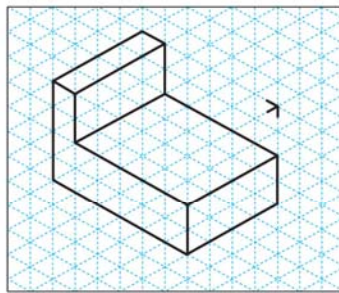
(2)



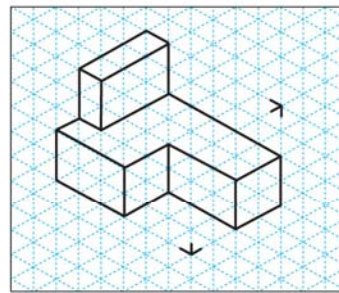
(3)



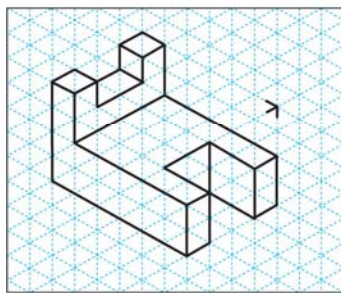
(4)



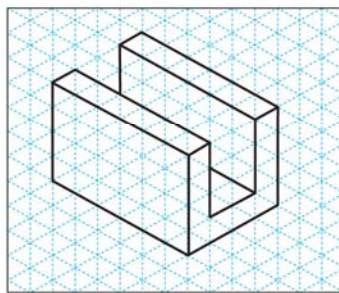
(5)



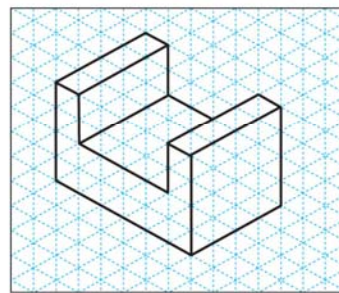
(6)



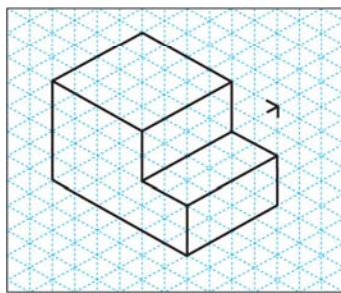
(7)



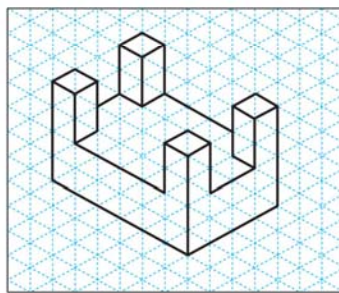
(8)



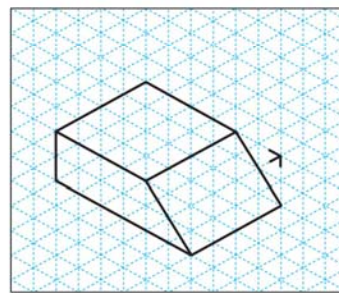
(9)



(10)



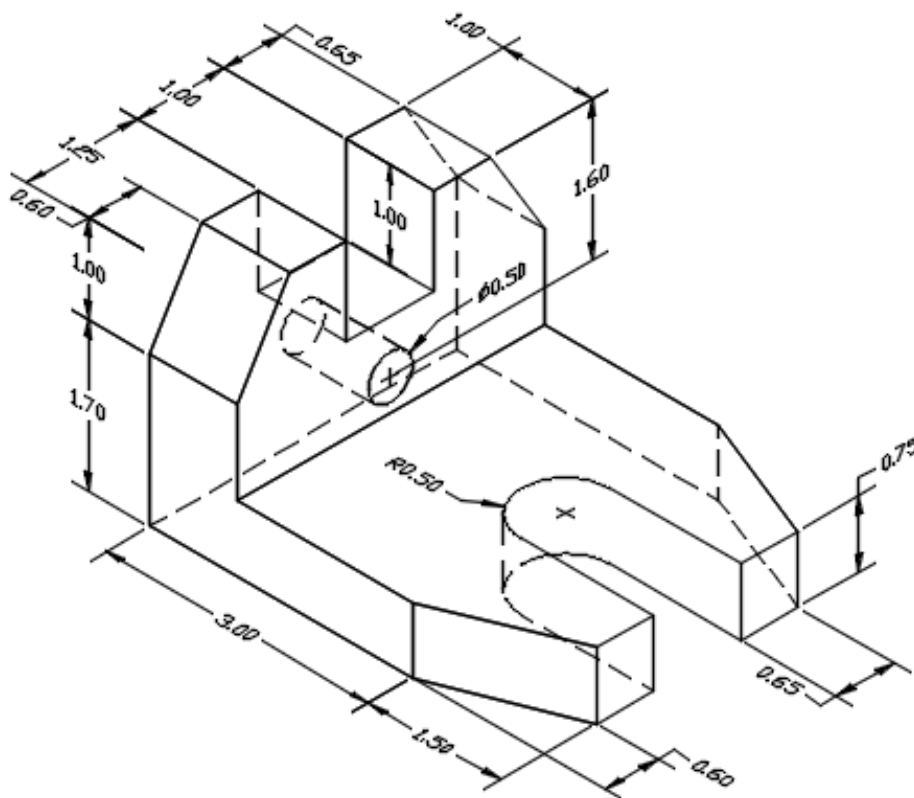
(11)



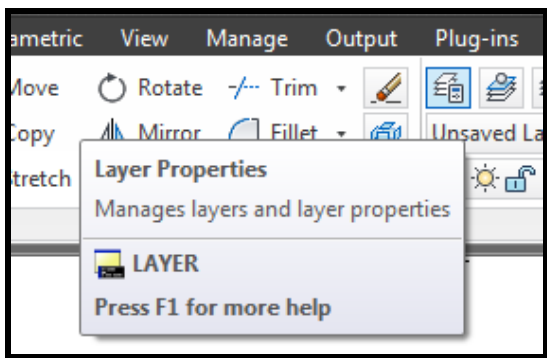
(12)

2. AutoCAD Exercise

The front, top and right-side views of the given object will be created.



1. Start by opening a new file.
2. In the *Select Template* manager, **left-mouse-click** on the *triangular* button to the right of the **Open** button, and select **Open with no Template – Imperial**.
3. Set the default units to inches.

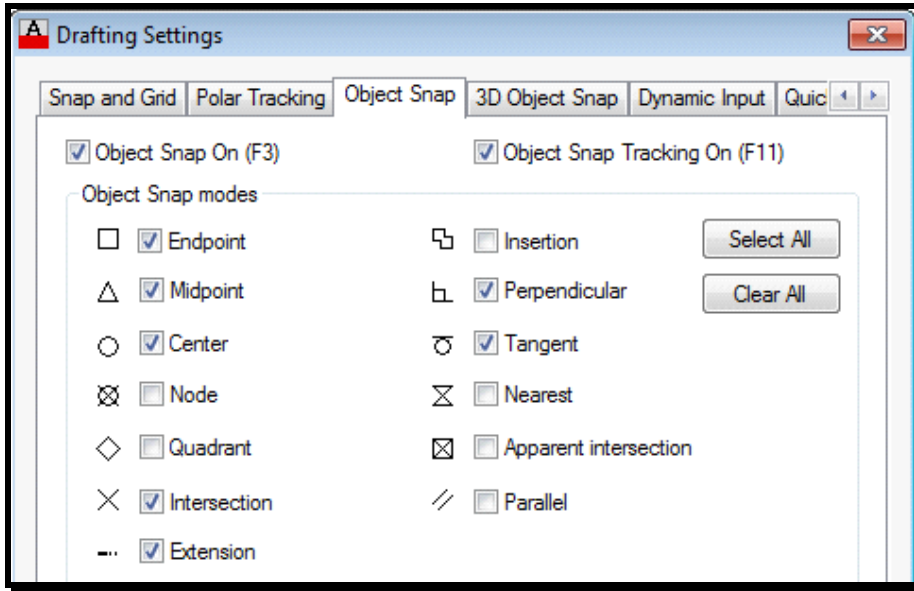


4. In the *Object Properties* toolbar pick **Layer Properties Manager**.
5. Click on the **NewLayer** icon to create two new layers by clicking on the :

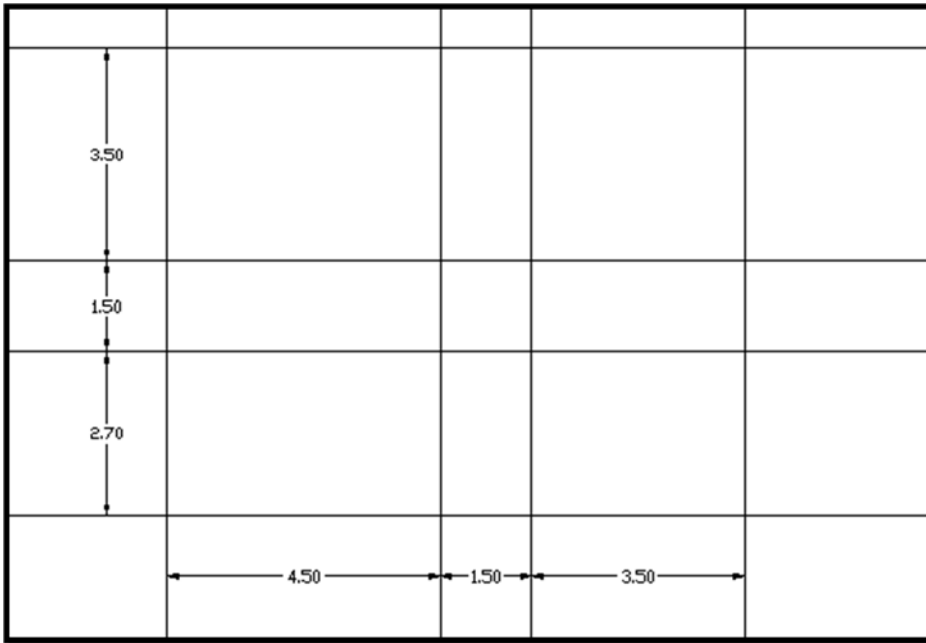
Layer	Color	LineType
Construction	White	Continuous
Object Lines	Blue	Continuous

6. Set the *Construction Layer* as the current layer. Click on the **OK** button to close the *Layer Properties Manager*.
7. **Right-mouse-click** on the *SNAP* button in the *Status Bar*, and **left-mouse-click** on *Settings* to open the *Drafting Settings* dialog box.

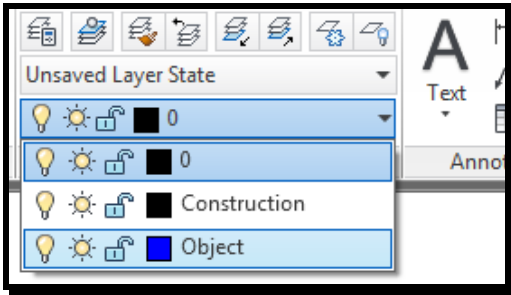
8. Switch the *SNAP and GRID* options on.
9. Select the **OBJECT SNAP** tab. Click on the **Object Snap On** box.
10. Modify the settings of the options as shown below.



11. Click on the **OK** button to close the dialog box.

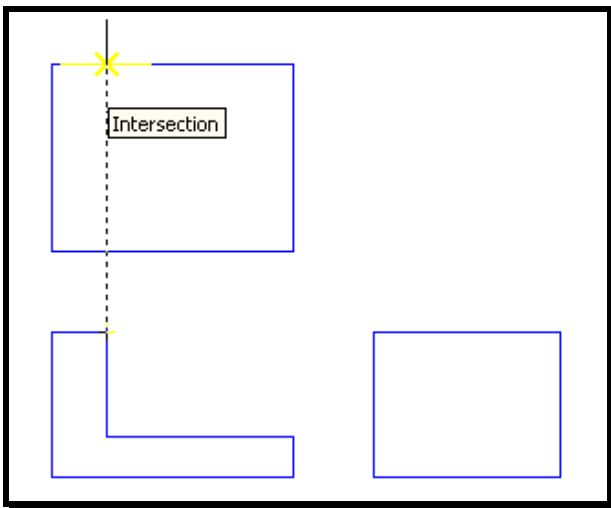


12. Create the construction lines shown above by selecting the *Construction Line* command in the *Draw* toolbar. You may use the *Offset* command in the *Modify* toolbar to create copies of horizontal and vertical construction lines.



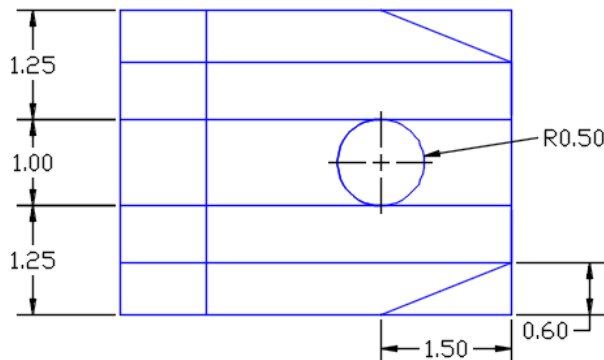
- On the Object Properties toolbar, choose the Layer Control Box, and **left-mouse-click** the “Object Lines” Layer to select this as the current layer. All entities created will now be placed in this layer.

- To start creating object lines, select the **Line** command icon in the *Draw* toolbar. Create the three rectangles for the outline of the top, right and front views using the construction lines as a guide.
- Turn off the *Construction layer* by clicking on the “light bulb” icon of the *Construction layer* in the *Layer Control Box*.

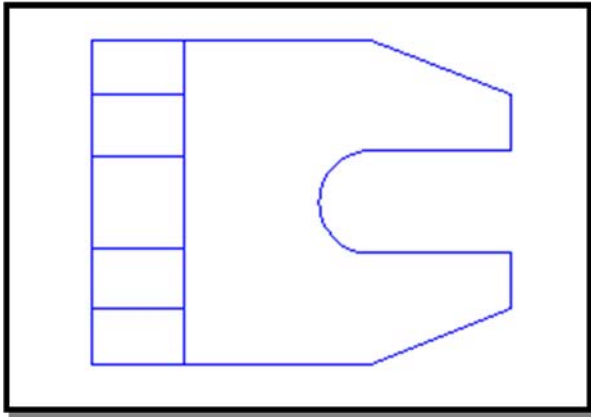


- Create more lines in the front view to obtain the L-shaped figure as shown. (You may use the *Offset* and *Trim* commands.)
- Turn on the OTRACK option in the Status Bar. The Object Snap Tracking allows the cursor to track along alignment paths based on other object snap points.
- Select the Line command. Move the cursor near the upper-right corner of the L-shape in the front view so that the symbol “Endpoint” is displayed.

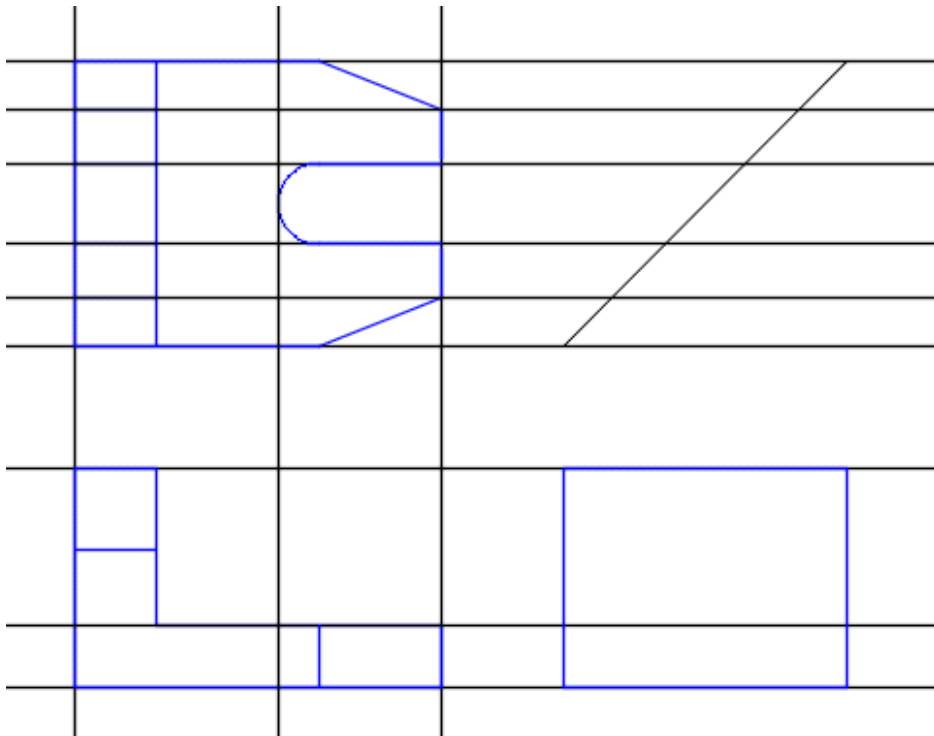
- Move the cursor upward and notice the dashed line displayed by *Object Tracking*, showing alignment to the point in the front view. Left-click when the *Object Snap* shows “intersection.”
- Use the same technique to locate the other end of the line.
- Create the additional lines and the circle shown in the top view. The horizontal lines can be created using the *Offset* command. The **Snap From** option in the *Object Snaps* toolbar may be combined with relative coordinates to locate points.



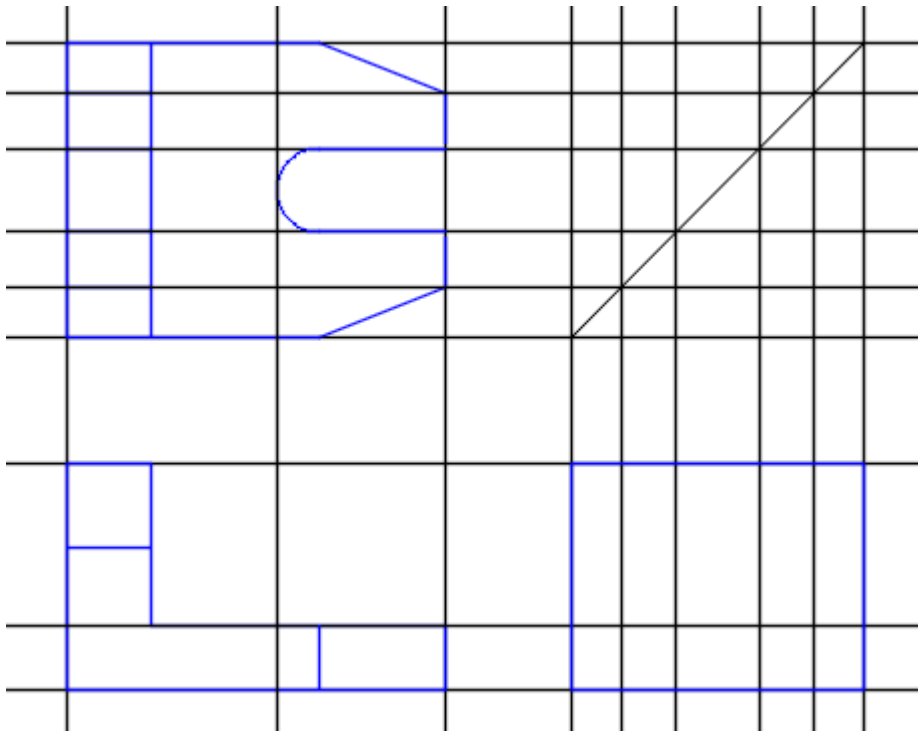
22. Use the *Trim* command to modify the top view, and create the two additional lines of 1.00 spacing near the left edge of the view so that the top view is as shown on the next page.



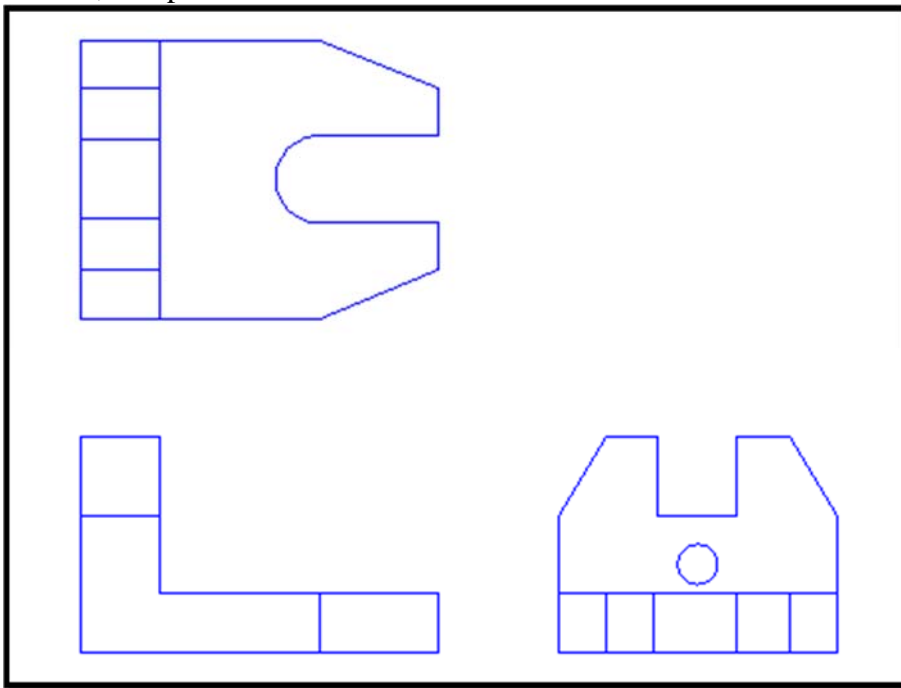
23. Turn on the *Construction Layer* by clicking on the *Layer Control* box. Select the *Construction Layer* as the *current* layer.
24. Create a 45° miter line to be used in transferring measurements from the top view to the side view.
25. Use the *Construction line* command in the *Draw* toolbar to create horizontal projection lines (right-mouse-click and select *Horizontal* option) through all endpoints in the top view.
26. Create the miter line at an angle of 45° as shown.



27. Create vertical *CONSTRUCTION LINES* passing through the intersection of the horizontal construction lines with the miter line.



28. Make the *Object Layer* the current layer. Create the object lines in the right view as shown. Also, complete the front view as shown.



29. In the *Layer Properties Manager*, add two new layers: one for **Center Lines** and another for **Hidden Lines**. Be sure to *Load* the appropriate *Linetypes* for these layers.

30. Create all the hidden lines for each of the three views in the *Hidden Lines* layer.

31. Create center lines of all arcs and circles for each of the views in the *Center Line* layer.

32. Save the drawing as **lab4.dwg**.