

Lesson 1

CAD Mechanical – Part 1

Beginning Drawing

Objectives

In this assignment you will learn to identify important **terminology** and **functions** of AutoCAD, to begin a new drawing and save data in the proper subdirectory, to use pull-down menus and or tool bars, and scale for the drawing assignments, and draw **horizontal lines**, **vertical lines**, **dimension lines**, and **change layers**.

Getting Started

Detailed instructions will be given for the activities in assignment 1. When this assignment is completed, you will complete three more drawings using the same procedures as performed in the first one. Examples of these drawings are printed on goldenrod paper at the end of this assignment and can be identified as:

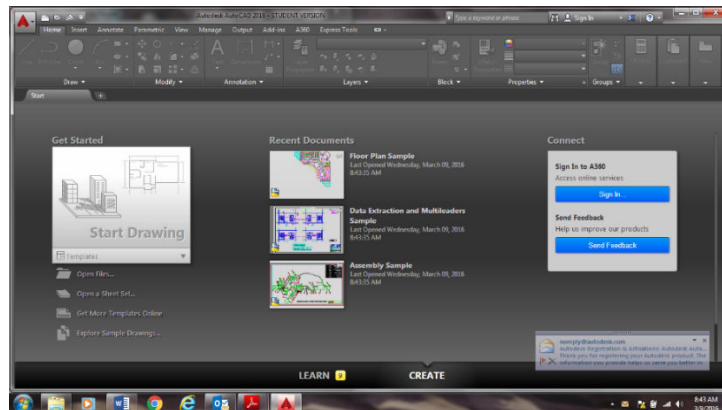
Sheet Metal Pattern C1

Template for Letter T C2

Template for Letter E C3

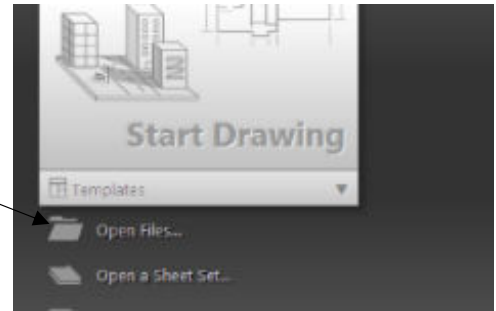
Anvil Gasket C4

1. Select the Windows icon at the bottom left of the screen:
2. Select "All Programs"
3. Select "Autodesk"
4. Select "AutoCAD 2016 – English"
5. Select "AutoCAD 2016" – English" Note: This is a big program and it takes time to load.

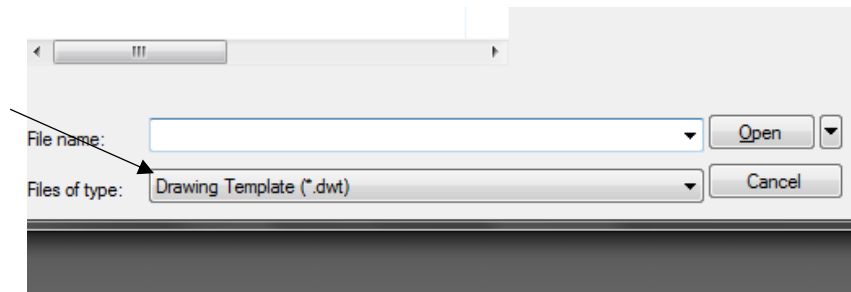
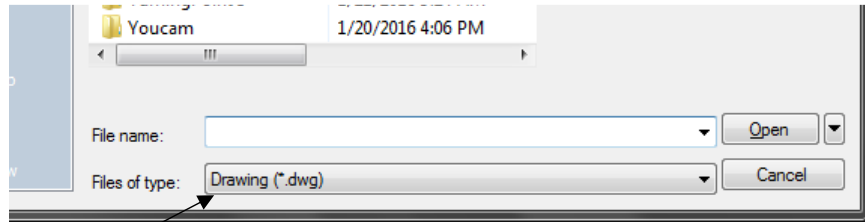


Note: If a pop ask for you to make a selection, choose the one that is recommended.

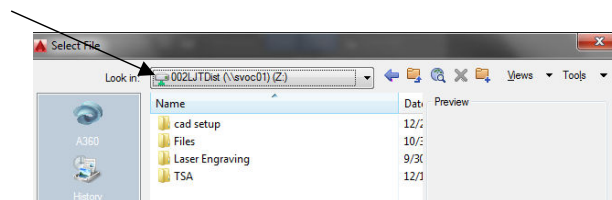
6. Select "Open Files..."



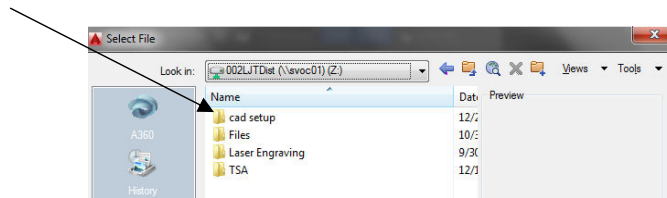
7. Click on "Drawing (*.dwg)" in Files of type and change to "Drawing Template (*.dwt)".



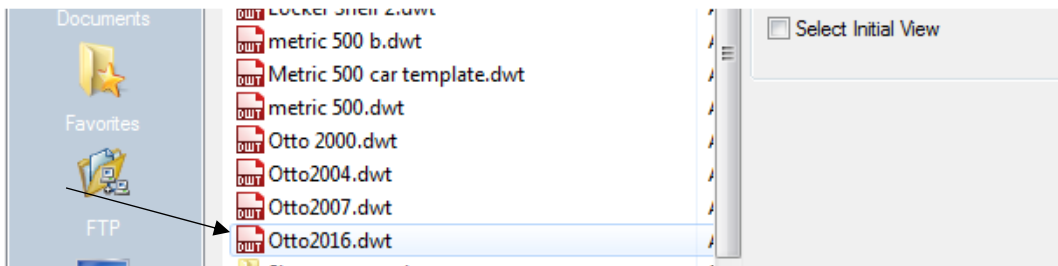
8. Navigate by choosing "Look in" to "Distribution" or (002LJTDist (\\svoc01) (Z:)) (Note: IF the Distribution folder is not available, navigate to <http://jhstechnology.weebly.com/mechanical-cad.html> and download all files to your U: drive. Then navigate to your U: drive in place of the Distribution folder.)



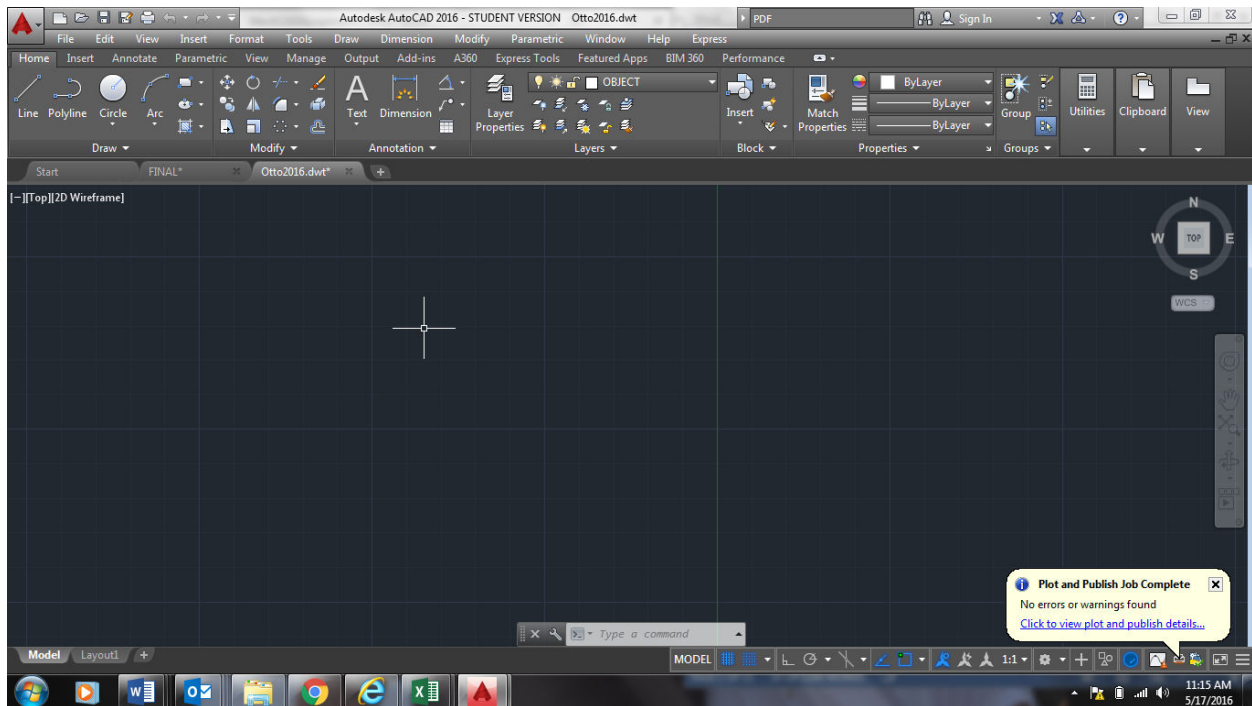
9. Select “cad setup” then click “Open”.



10. Select “Otto2016.dwt” and select “Open”. If asked, open as a Read Only file.

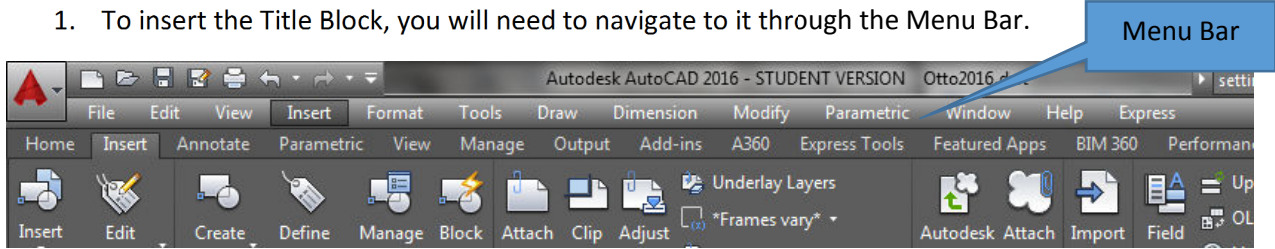


11. A Blank screen with a grid should appear on your screen.

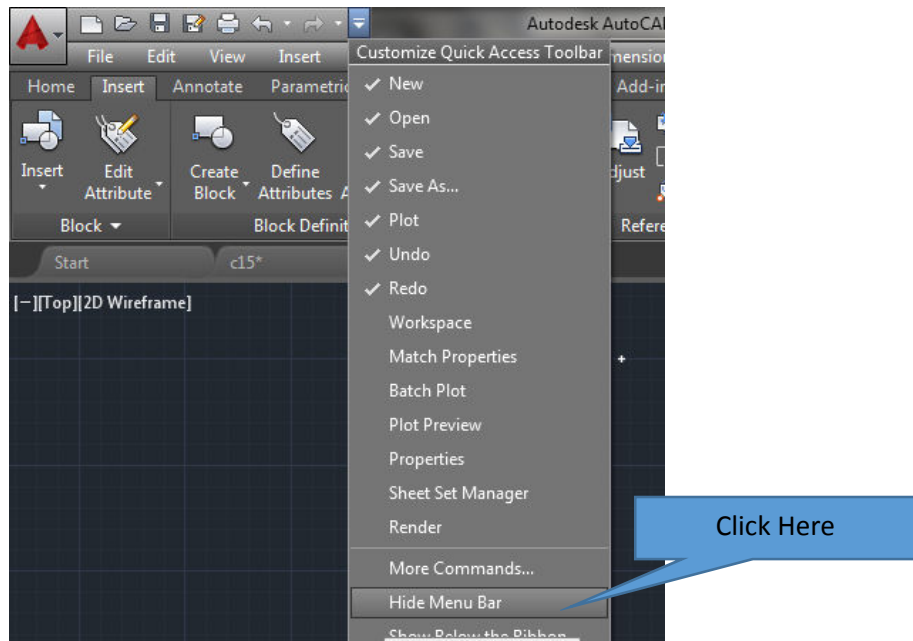


Inserting the Title Block

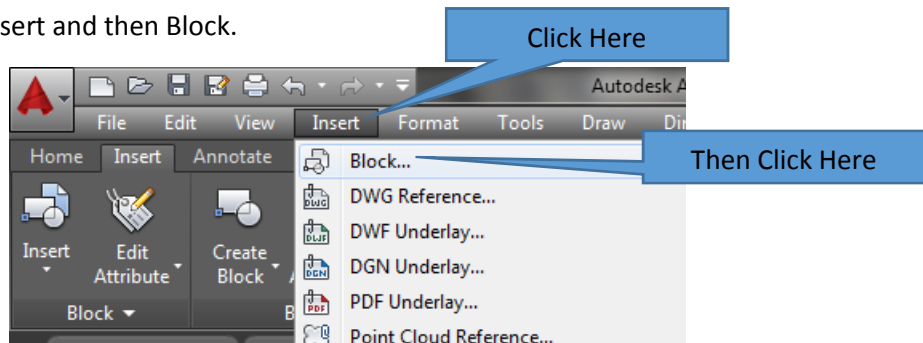
1. To insert the Title Block, you will need to navigate to it through the Menu Bar.



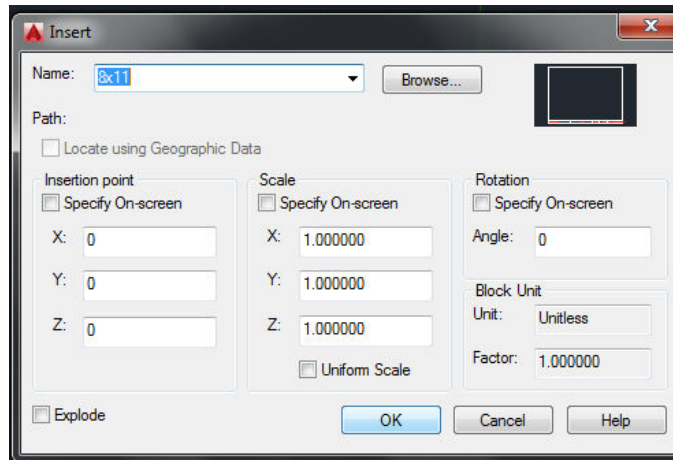
2. **If the Menu Bar is hidden**, select the down arrow at the top of the screen and in the Drop down List, click on Menu Bar.



3. Now click on Insert and then Block.



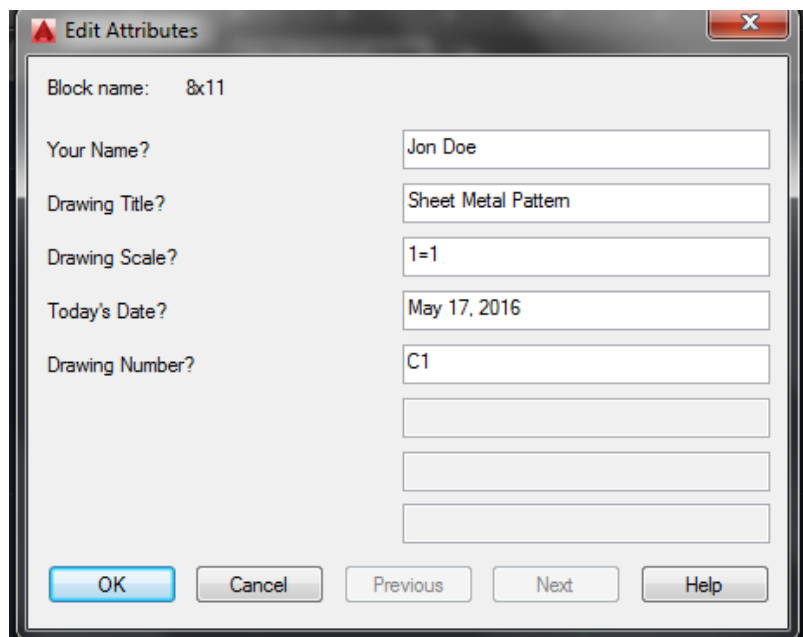
4. A Pop Up window will appear.



5. Make sure your Pop up window is set up exactly the same and press OK.

Setting Up the Title Block 12. 13.

1. When you click the OK button, type the information into the title block dialog box as illustrated and then click OK:

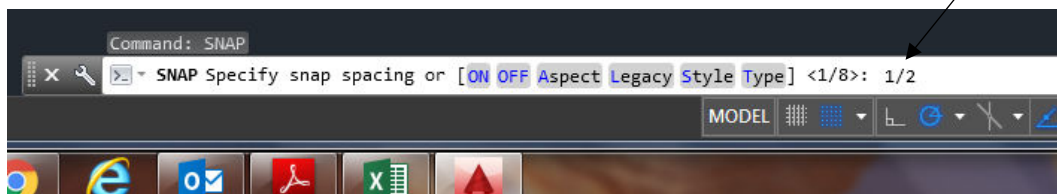


2. You will notice that a **title block** (including borderlines) with the **drawing information** appears on the computer screen. You will **draw the assignment inside the borderlines**.



5. If it is easier for you, refer to the drawing entitled “**Sheet Metal Pattern,**” from the **drawing folder in the distribution folder** at this time .Use it for **interpreting the required dimensions** for the **assignment**. **Keep the drawing available as you read instructions** from this manual.
6. You will need to **become familiar** with the **AutoCAD ribbon menus** and the **tabs**. It is also imperative that you to become familiar with the **command prompt** at the **bottom** of the **screen**. If you know the name of a command you are using, it is often quicker to type the command at the command prompt rather than waste time searching menus.

- In the **command prompt window** type **snap** and **press** the **Enter** key. Change the snap from **1/8th to 1/2 inch**. By changing the snap, it simply means that each time **you move the mouse**, the cross hair on the **screen** will move **1/2 inch instead of 1/8 inch**. The snap will remain the same until changed again by the user.



- In the command line, type “Grid”. Select “On”.

Information Time-Out

There are three ways to view your coordinates.

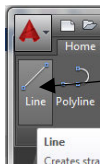
Relative, based on the last point clicked. Example: 2 1/64<, 5, 0

Absolute, based on an origin of 0, 0. Example: 3, 2 7/8, 0

Direct Distance Entry, based on the last point clicked **plus** the user moving in the correct direction and keying in the distance.

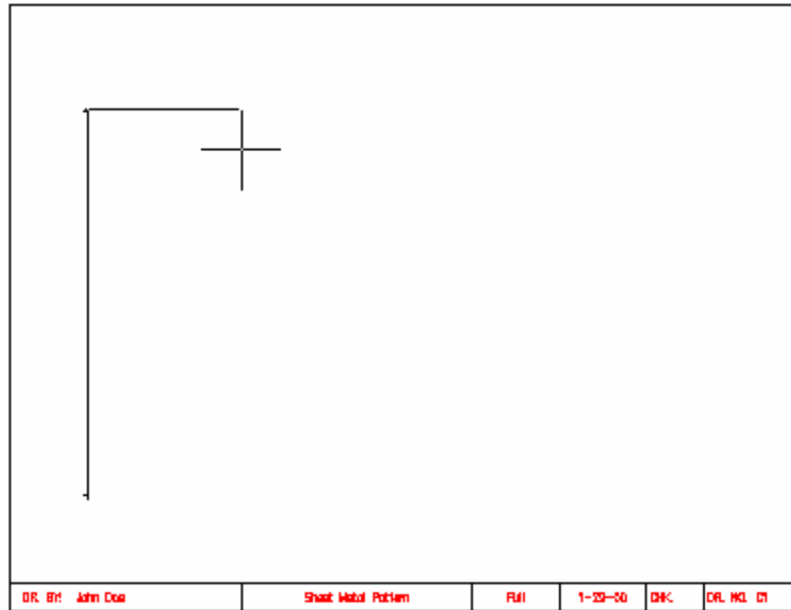
It is best to work in the **Relative** mode. The coordinate’s mode can be changed by pressing the **F6** key and observing the coordinates display in the lower left corner of the screen.

- From the **Home** tab on the left side, you are now going to select the **line tool** icon.

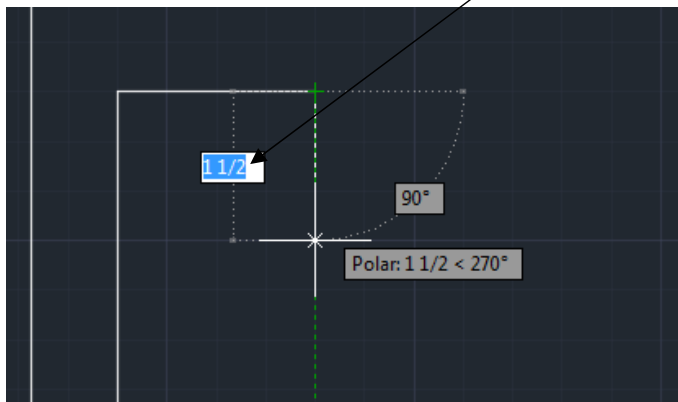


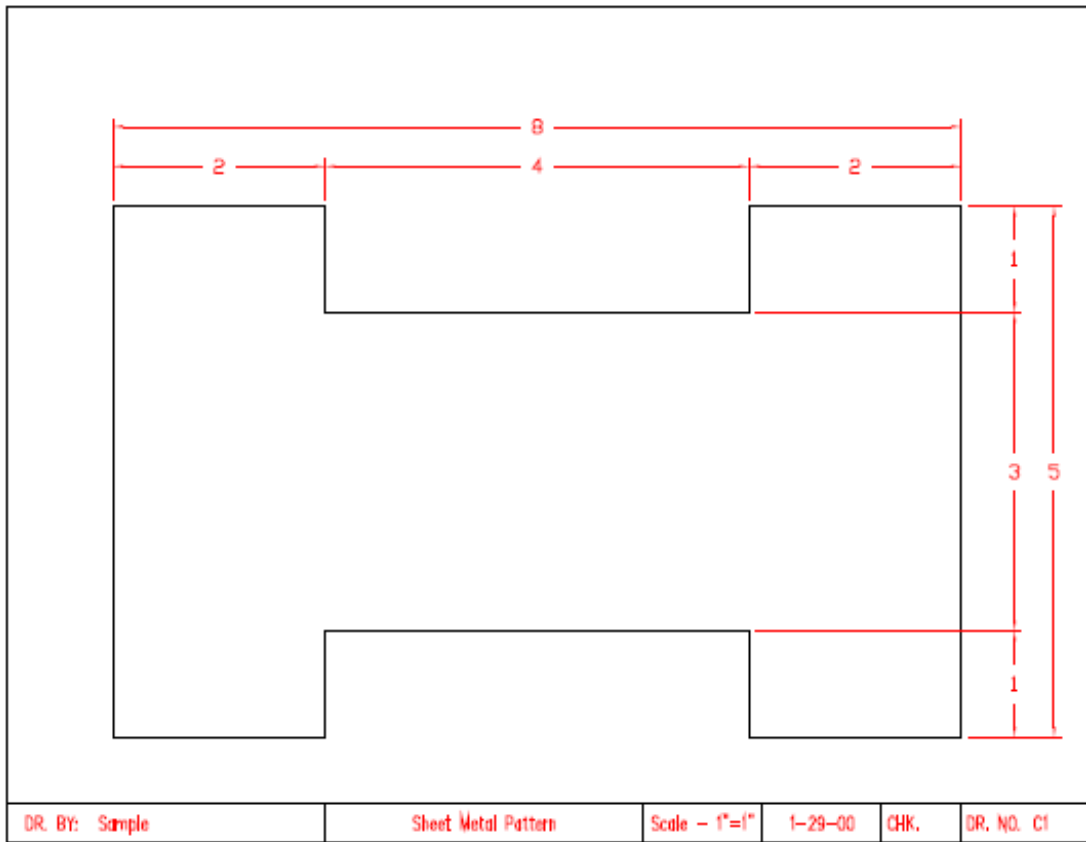
- This icon enables you to draw lines. You will begin the sheet metal pattern drawing by selecting the **first point** in the **lower left corner above the title block area**. Draw the **first line up 5”** as noted on the **Drawing C1**. Select the **first point** of the **line** by

pressing the **left** mouse button. When the line **reaches 5"**, **press** the **left** mouse **button again** to complete the line. Move the mouse to the **right 2"** for the next point as illustrated below:

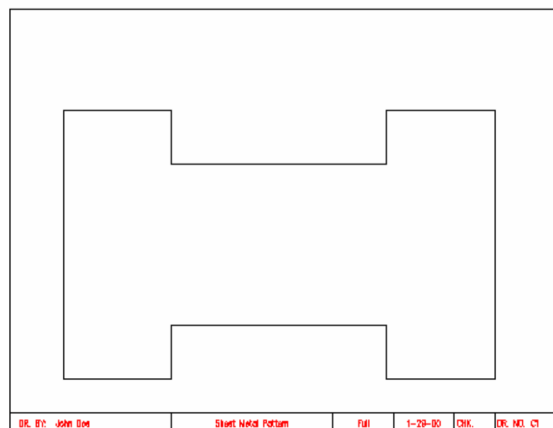


Observe the **relative coordinate display** on the screen as you draw: **1 1/2** means **1 1/2 inches**.

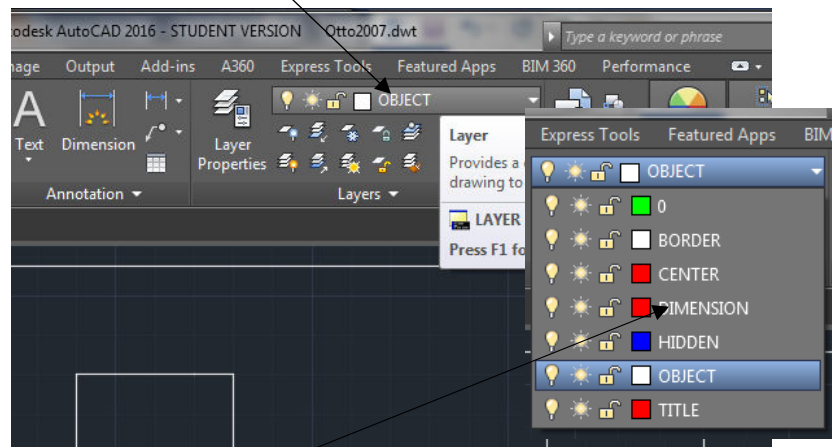




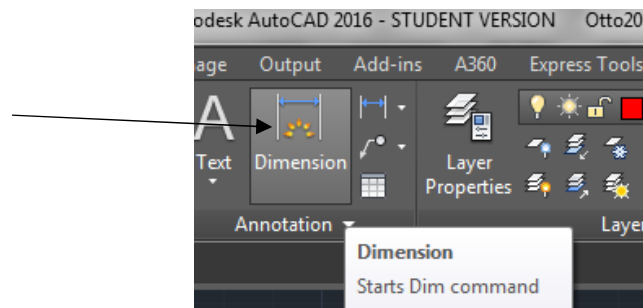
11. Using the measurements from the drawing, continue the drawing
12. Connect the lines for each segment by pressing the left mouse button. When you close the drawing after the last line segment, press either the Enter or ESC keys. When completed, the drawing should appear as illustrated below:



13. In the next part of the assignment, you will learn to **change layers** and place **dimensions** onto the **drawing** as **illustrated** on the **sample drawing C1**.
14. You will need to change to the **dimension layer** by selecting this layer from the **object properties menu bar**. You will change from the object layer to the dimension layer by clicking the scroll-down arrow or triangle and selecting the dimension layer. The **dimension** layer will now be the **current layer**.
15. Click on “Object” on the Ribbon bar.



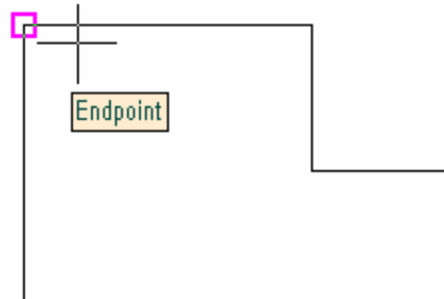
16. Select “DIMENSION”.
17. You will need to change the **snap back** to **1/8th** from **1/2** inch. Do this at the command prompt by typing **snap** and pressing the enter key. Then make the change.
18. You are going to make **linear dimensions** for both **horizontal** and **vertical dimensions**. You will first do the horizontal dimensions across the top of the drawing.



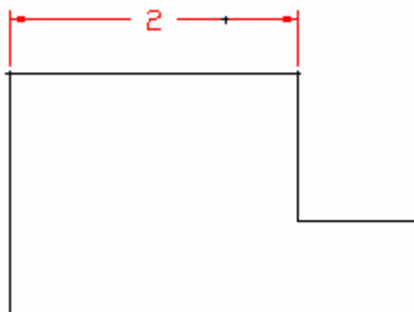
19. **Dimensions** should be drawn $3/8$'s from the object and $3/8$'s apart from one another.



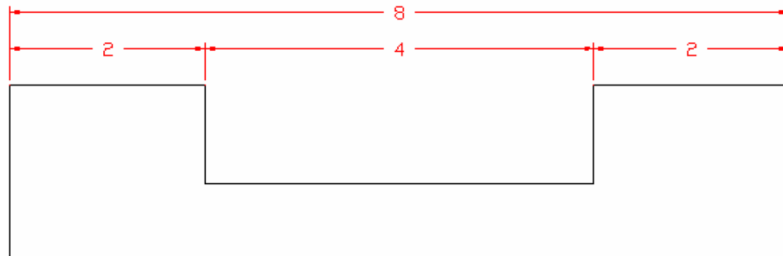
20. Select the **linear dimension** icon from the **dimension toolbar**. Move the mouse to the **upper left corner** of the drawing. A small purple square will snap onto the **endpoint** of the drawing. This is the **osnap** feature. **Osnap** means **object snap**. The **snap** will **jump** to **any intersection** on the **object** where you move the **mouse** near as **illustrated** below:



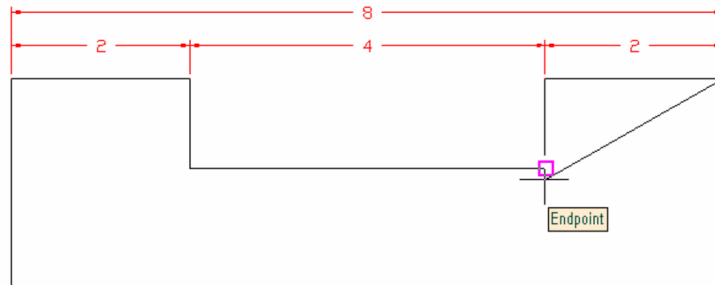
21. Select the **first extension line end point** as indicated above and then select the **second point for the extension lines**. These points are selected by clicking the **left mouse** button. When the **second point** is **confirmed**, move the cursor with the mouse **above the drawing** to a location of $3/8$ " to locate the **dimension** line as illustrated below:



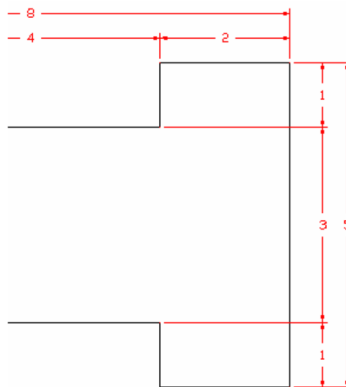
22. Repeat the command by pressing either the space bar or the enter key and locating the points until all of the horizontal dimensions are completed.



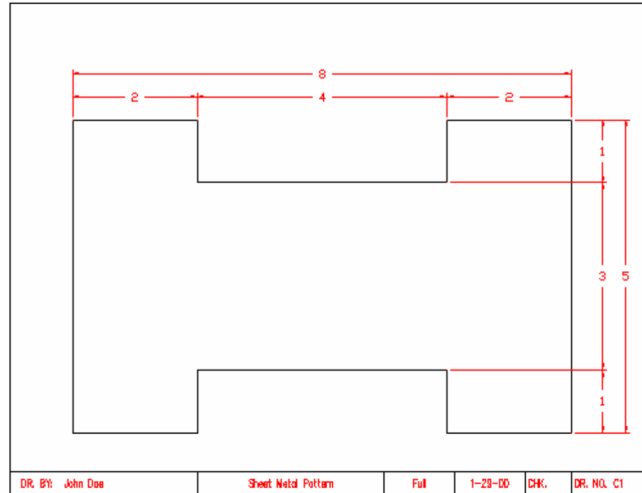
23. Repeat these steps for the vertical dimensions. The second end point for the second extension line should be selected at the point indicated below:



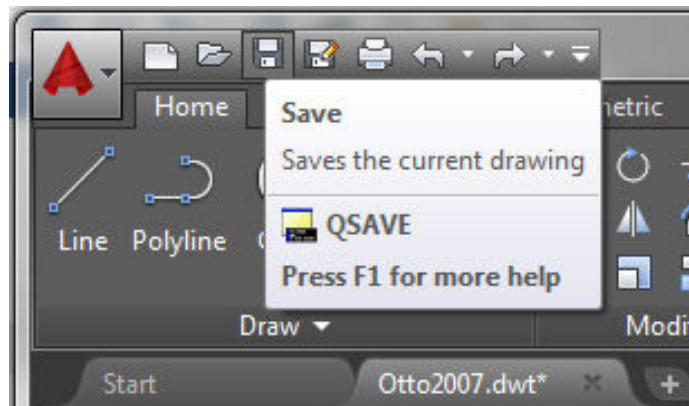
24. The extension lines for the vertical dimensions need to be selected from the inside points of the drawing when applicable in order to draw the extension line long enough. Continue all points until all vertical lines are drawn. Remember that all points are selected with the left mouse button. To repeat the command for another dimension, remember to press either the space bar or the enter key. This saves keystrokes and allows you the opportunity to repeat the dimension command.



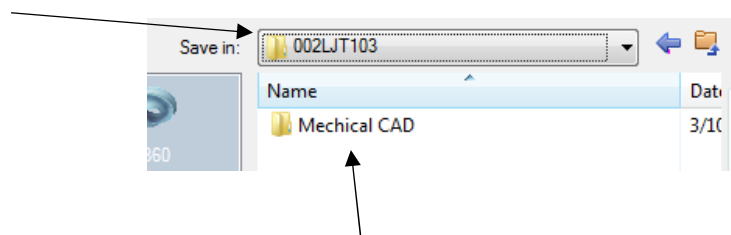
25. The **completed drawing** should appear as illustrated below:



26. Select save from the pull down menu or the save icon.

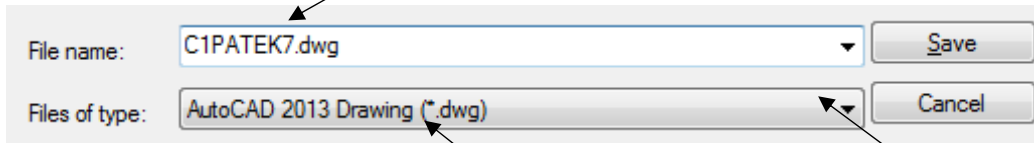


27. When the **save options** appear, you must navigate to **your assigned class folder** on the lab's network server. If you do not place the file in the correct location, you will receive read only messages and the file will not be saved. Click the drop down arrow to the right of the Save In Window. A menu tree will appear. Select Computer. Locate the 002LJT U: Drive Folder assigned to you and click it.



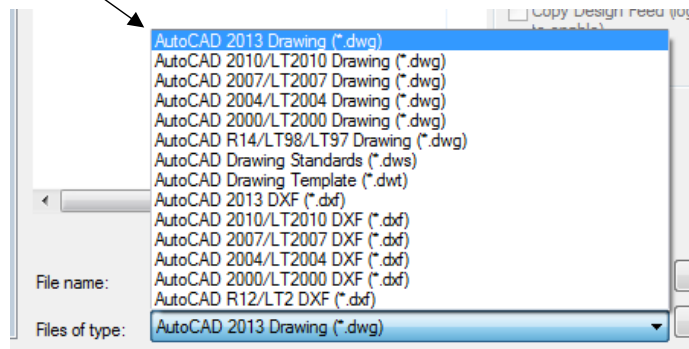
28. Create a **New Folder** and name it **Mechanical CAD**.

29. Click the File name window and **name the file C1 (LAST NAME FIRST INITIAL)(PERIOD)**. Click the save button and the file should be saved.



30. Make sure that Files of type has AutoCAD 2013 (*.dwg) is selected.

31. If you need to change Files of type: click on the bar next to it and a menu list of file types will appear. Click on AutoCAD 2013 Drawing (*.dwg)



32. **Complete drawings C2, C3 and C4 before answering the questions** or proceeding to Activity 2.

Terms to Know

Instructions: Copy the following terms into your notebook and define them.

Ribbon	Save
Line	Save As
Vertical	Border
Object Layer	Snap
Crosshair	Osnap

Border Layer
Ortho
Coordinate Display
Home
Horizontal
Dimension Layer

Layer Control
Template .dwt
Drawing .dwg