Homework 3 – MS Word Drawing

Why:
Quite often, an engineering project culminates with a written report which usually includes figures. As an engineer, your performance will be enhanced by learning different methods used to create figures for reports. Using MS Word drawing tools is one of the ways used. This activity supports course objective #1.

Learning Objectives:
1. To use MS Word drawing objects to create technical sketches for inclusion in reports.
2. Be able to use the snap and grid functions.
3. Copy and group drawing objects.
4. To align, distribute, rotate and flip objects and groups of objects.
5. Use ordering and word wrapping.

Performance Criteria:
1. Prepare neat and professional looking sketch.
2. Proper sketch proportion.
3. Be able to use duplicating features to work faster.

Getting Ready:

- **TURN OFF THE DRAWING CANVAS.** See the handout on the webpage for details on how to do this. The menu sequence is Tools-Options. Uncheck the appropriate box on the General tab. **YOU SHOULD DO THIS EACH TIME YOU CREATE A DRAWING IN WORD IN THE LAB.** This setting will remain set once you do it one time at home. The canvas function in MS Word is difficult to work with. Your works will be accomplished in a more efficient manner with the canvas turned OFF.
- Open the Drawing Toolbar (shown below) using the menu sequence View-Toolbars-Drawing.

Right-click on a menu or toolbar and pick Customize. Click on the Toolbar tab and select New. The new toolbar will appear on the screen. Pick on the Commands tab and highlight Drawing in the Categories window. Scroll down in the Commands window to the commands you desire. Drag the button from the Commands window to the toolbar. Close to finish.

- Pick the Draw tool on the Drawing toolbar and select the Grid option. Set the values in the dialog box as shown to the right. Your snap will be .06 inches and the gridline will be displayed every four units. You will see a .24 x .24 grid on your sheet.
PLAN:

1. Open a Word document and add a header on the right side to include your name, METBD 050.n, HWK 3 and the date. Use text to identify each of the following problems.

2. Draw the figure shown below using the LINE tool. The number indicates the length of the side in grid blocks. Draw the figure a second time using the FREEFORM tool which is found in the AutoShapes-Lines menu. The line width for the second one should be 1.5 pt. and the Freeform should be filled with a yellow color.

3. Draw two concentric circles. The outer one is one-inch (4 blocks) diameter and the inner one is .75 inches (3 blocks). Use the alignment tools to center them with respect to one another.

4. Draw a circle having a diameter of .96-inch (1-in nominal). Copy it and paste it four times to obtain five total circles. Align the circles horizontally, evenly spaced. There should be .96-inch (1-in nominal) spacing between the circles as shown in red. Be sure to use the align and distribute tools to do this.

5. Draw a regular hexagon having a .64 height. Copy the hexagon and align the copy horizontally with the first hexagon. Rotate the second hexagon through 30 degrees as shown below. Be sure to use the Free Rotate button while holding down the SHIFT key.
6. Create the following figure:

![Circle Dia = 4](image)

![Rectangle 5 x 3](image)

Note that the center of the circle is exactly at the corner of the rectangle.

7. Copy the figure from number 6 and paste it below the original. Change the ORDER of the objects so that the rectangle is in front of the circle.

![Rectangle below Circle](image)

Remember that you don’t have to include the red text or objects in your document.

8. Copy the figure from number six and flip it. What do you have to do to get an exact mirror copy?

9. The ORDER tool is essential when creating the following figure. Use the FLOWCHART: OR symbol two times: one with no fill and one with black fill. You will also need two squares with white fill and no border line. Use 1” diameter for the OR symbol. Stack and align the drawing objects to get the required symbol.

![Make this one!](image)

10. Create the following figure. Use a textbox for the dimension value. It will have no border line and a white fill. The dimension textbox will be IN FRONT of the line.

![Settings for the arrows on the dimension line](image)
11. A truss is a planar structure that is used to support loads over a fairly large distance. They are used mainly in the construction of buildings and bridges. The diagram shown below represents the truss, which will be the basis for much of the homework assignments in the course. Use the MS Word drawing tools to sketch the truss shown below in your document. Do not sketch the .24 x .24 grid or the notes given in red.

11. Truss Sketch:

See next page for required size information.

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**Recommended Drawing Grid Settings**

**Size Specifications:**
- Text: 10 pt Arial
- Force Arrows: Size 3 Arrows
- Force Text: .75 pt lines
- Dimension Arrows: Size 2 Arrows
- .75 pt lines
- Truss Members: 1.5 pt. solid lines
- Dimensions & Witness Lines: .75 pt solid lines
- Supports: .50 pt solid lines
- Truss Pins (Circles): .06 Diameter

**Required Sizes**
Support Enlargements

Set your displayed grid to 1 division in each direction to create the supports shown above. Note that the grid will not be visible unless you use the view zoom to enlarge the sheet while you work.

HINT: When you click in the word document to de-select an autoshape, Word will always shift to the beginning of the page. It is often a good idea to create drawings in the upper left hand side of a document page to avoid that issue. You can always copy a figure and paste it where you want it to be.