

Assignment 8

CAD Mechanical – Part 2

Drawing & Dimensioning Circles

Objectives

Before beginning this module, **you must have completed CAD Mechanical – Part 1**. The skills you developed earlier will be necessary for you to **continue your AutoCad experience** in this module.

In this assignment you will apply the circle, center mark, polar array, dimension radius, dimension diameter, and move location of dimension text commands along with commands previously learned.

Getting Started

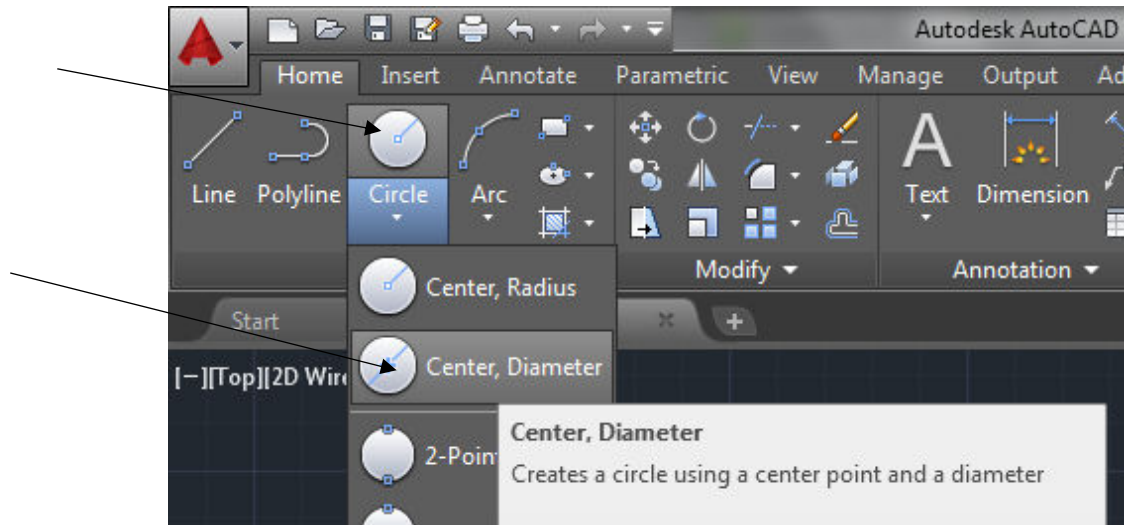
1. When AutoCAD's menu appears, scroll down and select the **Otto 2016.dwt** template file as you have on the previous assignments.
2. Complete the title block and by typing the information into the block. The drawing will be drawn **full scale**. (1=1)
3. Insert the drawing title and drawing number illustrated below:

Gasket	C13
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4. Save the drawing in your Mechanical CAD folder in your U: drive. (C13LastFirstPd)
5. Remember to turn the **snap** back **on** while drawing lines and dimensioning the drawing.

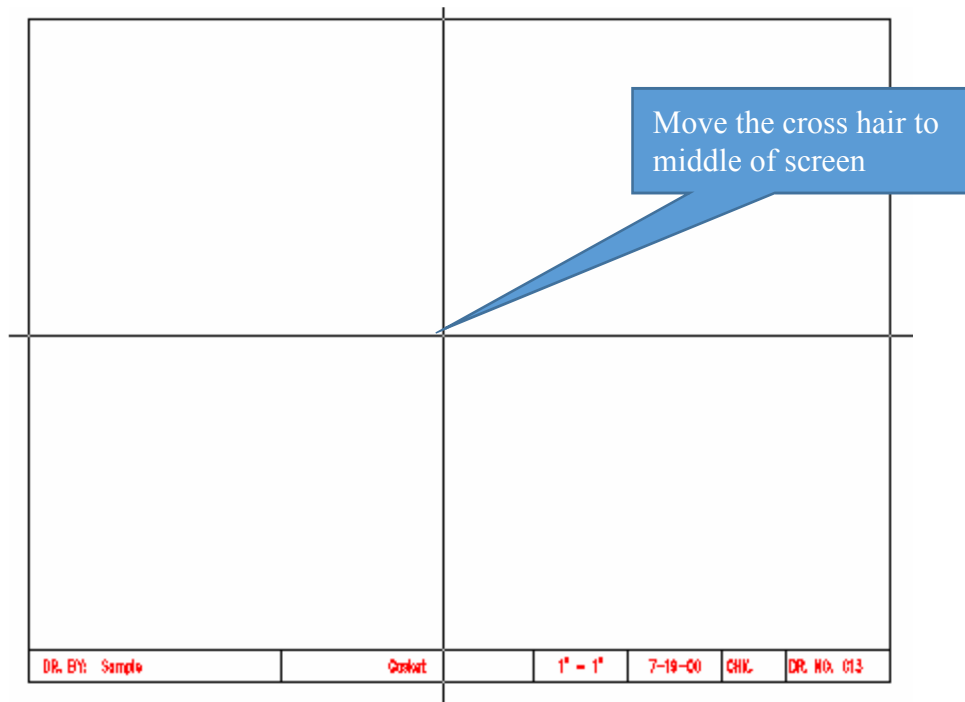
Note: If a pop ask for you to make a selection, choose the one that is recommended.

Command: Center, Diameter

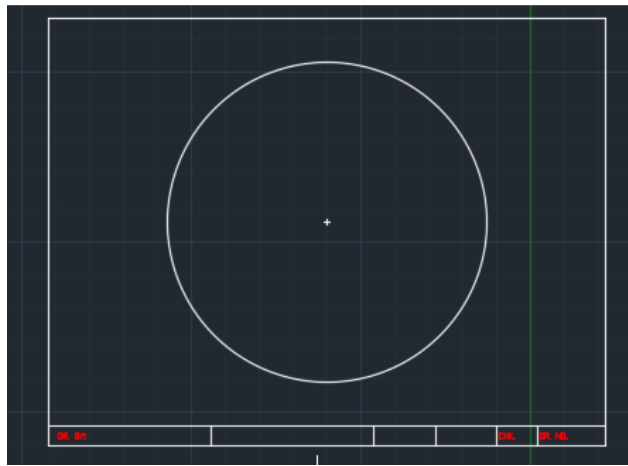
1. After the **title block** is completed, make the **object layer current**.
2. From the **Home tab Ribbon** menu select the **Circle** command. Move the mouse to the side and select **Center, diameter**.



3. Move the **cross hair** to the **middle** of the screen and pick a point as shown below:

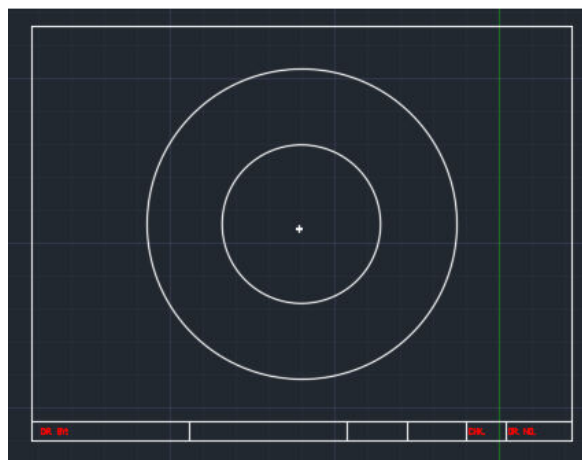


4. Click the **mouse** at this **location** and **move the mouse in and out**. Notice that a **circle expands and contracts** as you **move the mouse**. When you picked the point near the middle of the drawing area, you specified the center point for a circle. Notice that the **radius** of the **circle** is displayed **on the status line**. As you move the mouse the numbers should appear in **units by 1/8" increments**. If not, **turn the ortho command on**.
5. There are **two options** for **drawing the desired circle**. You can **drag the mouse** until the **desired diameter** is displayed on the status line, **or** you can **click the command line** and **type the distance**. Keying in the diameter in the command window is useful for circles with diameters measured in small units.
6. Press the **D** key and enter. Move the mouse until the **diameter** of the **circle** is **5 7/8"**. **Drag the mouse** until the **status line reads 5 7/8"** and **pick the mouse**. The **circle should appear**.



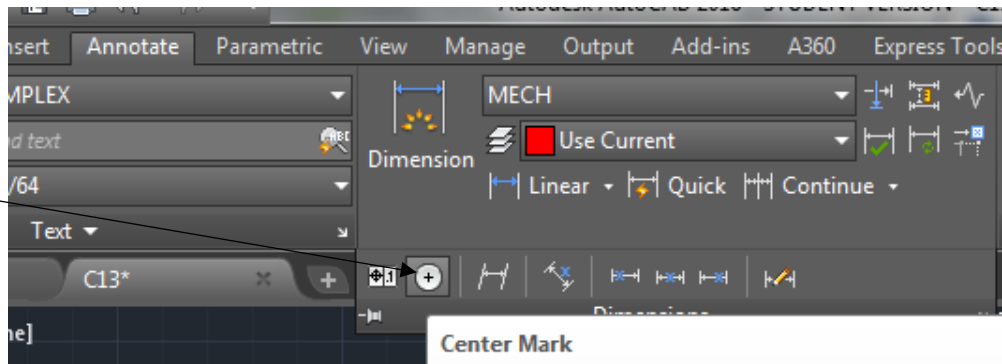
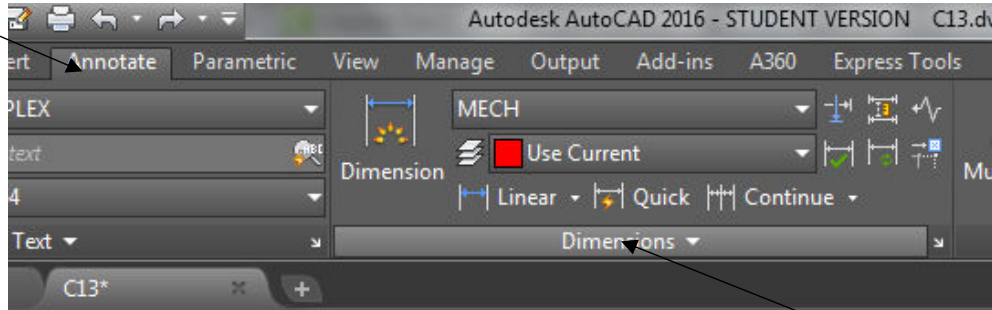
Note: The blip that marks the center of the circle is needed for drawing the next circle do not use redraw command to erase it.

7. Repeat the **command** and **draw the 3" diameter circle**.

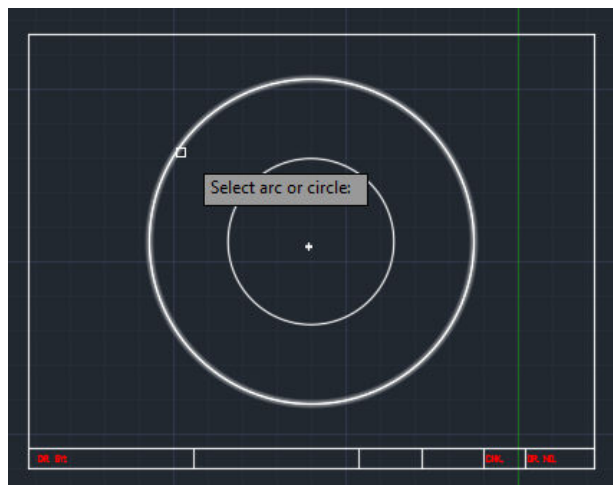


Command: Center Mark

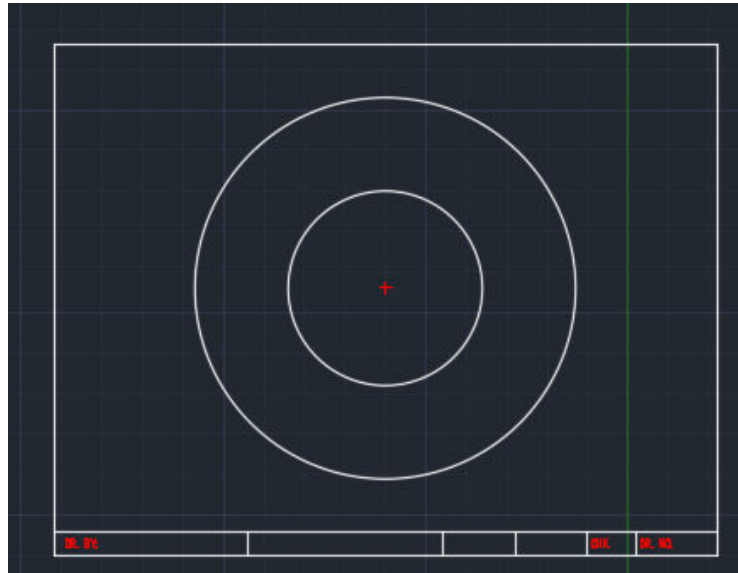
1. **Change layers** to the **center line** layer. From the Annotate Tab Ribbon, Select Dimension arrow to expose the Center Mark command.



2. Select the **Center Mark** command and **position** the **pick box** on the **diameter** of the **outer circle**.



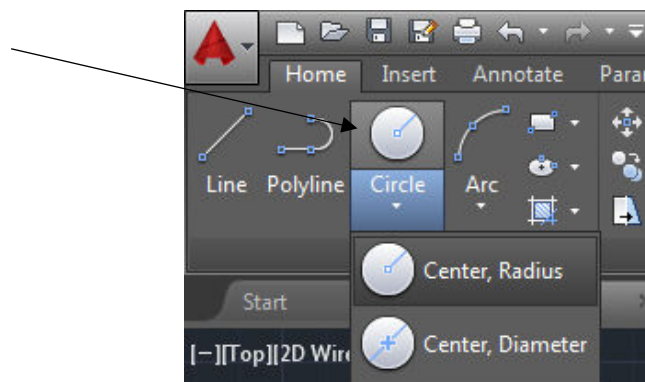
- When you pick the **outer circle**, a **center point** is **drawn** into the **center** of the **drawing**.



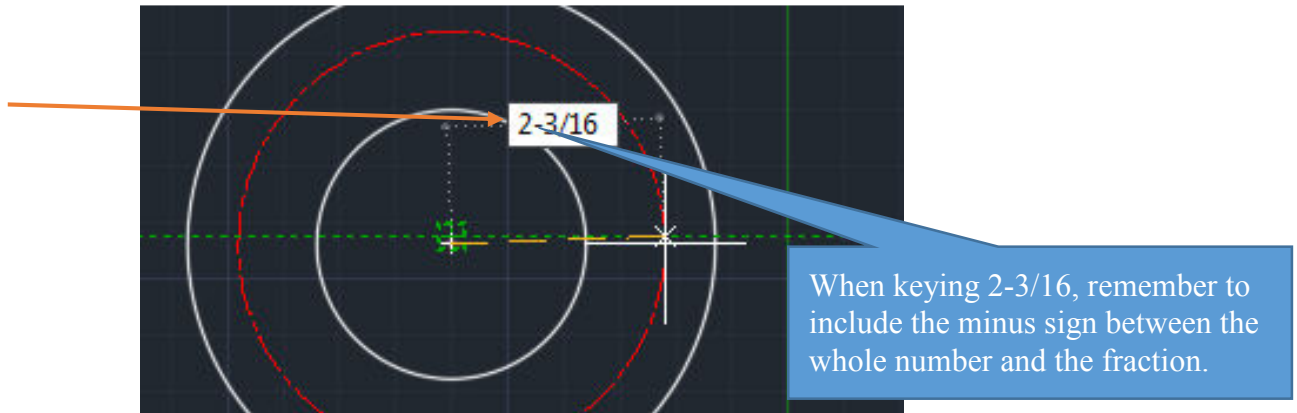
Note: You can now use the Redraw command to remove the blips from the drawing. Notice that the center point is red, which is the color of the center layer.

Command: Center, Radius

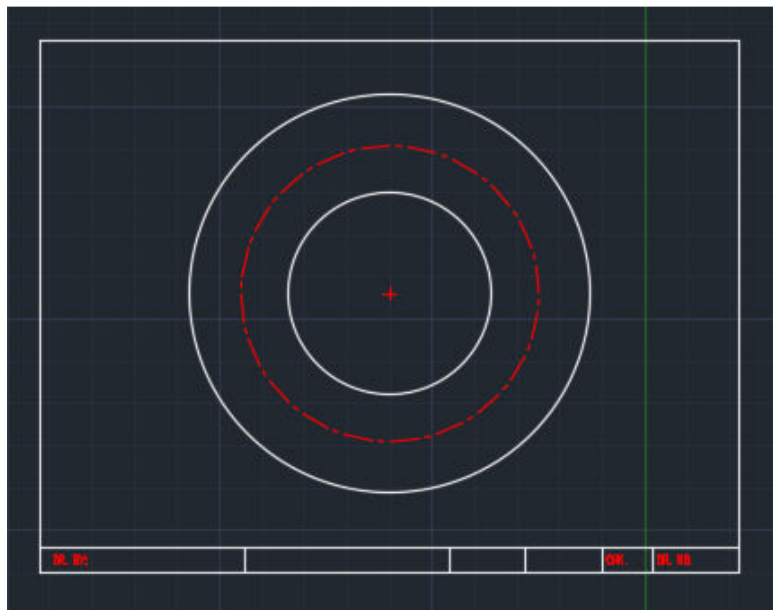
- The **snap** for your **drawings** is set to **1/8"**. If you tried to **drag** the **mouse** for the **center line circle** you would **not** be able to **attain** the correct **radius** of **2 3/16"**.
- Select the **Home** menu and **choose** the **Circle** command. **Select: Center, Radius**.



3. Click the **center point** of the **inner circle**, when you move the mouse, notice the Status Line will not read 2 3/16". Type 2-3/16.



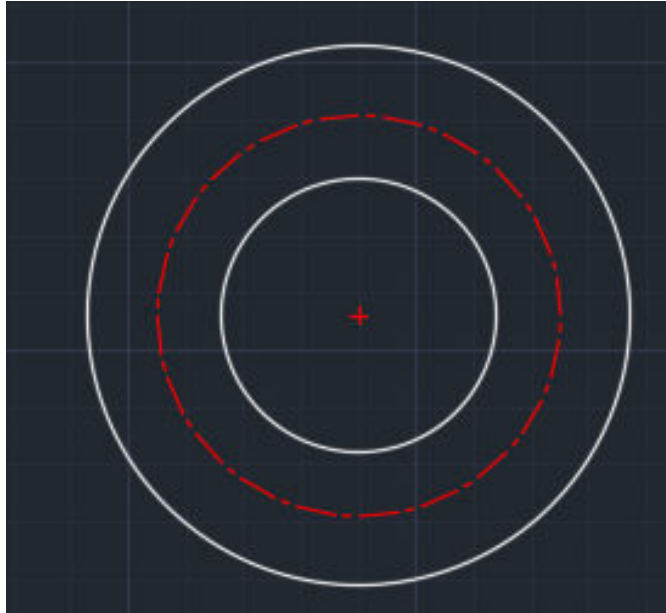
4. Press the **Enter** key. The circle with a radius of 2 3/16" should be **drawn**.



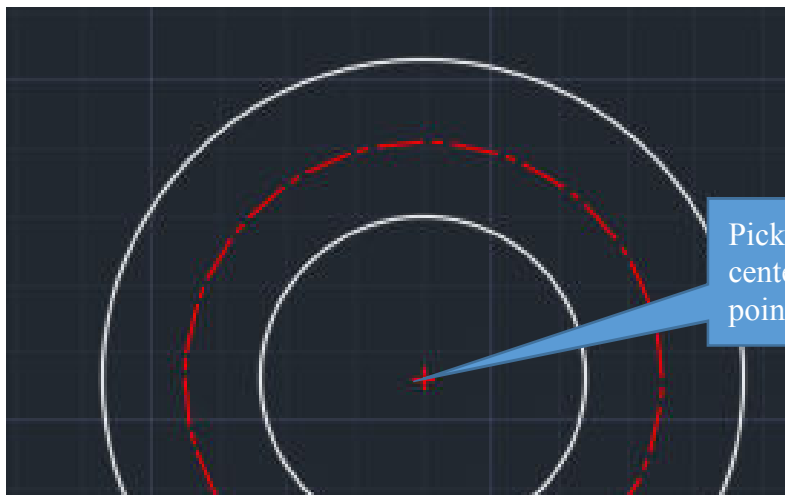
5. If you followed the instructions correctly, the last **circle** should be **red** and be drawn with **center lines**. If you refer to the golden rod sample drawing, you have just drawn the center line location for the eight 5/8 diameter circles.

Command: Center Lines

1. It is easier to draw the **two vertical** and the **two horizontal center lines** from the **center point** at this time.
2. **Zoom in closer** to the three circles as illustrated:

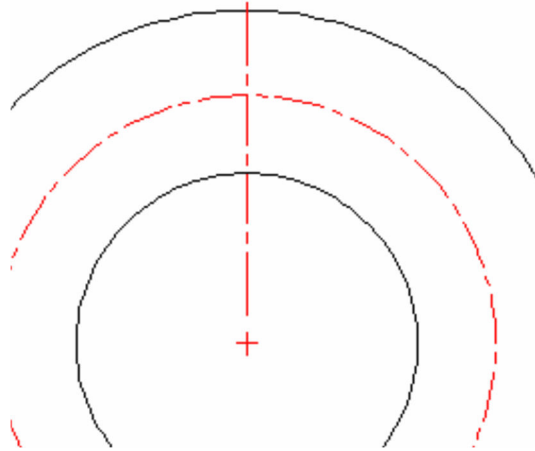


3. Select the **line command** and **position the mouse** about **1/8"** above the **vertical line** on the **center point** as illustrated. Pick this for the start point of the line.

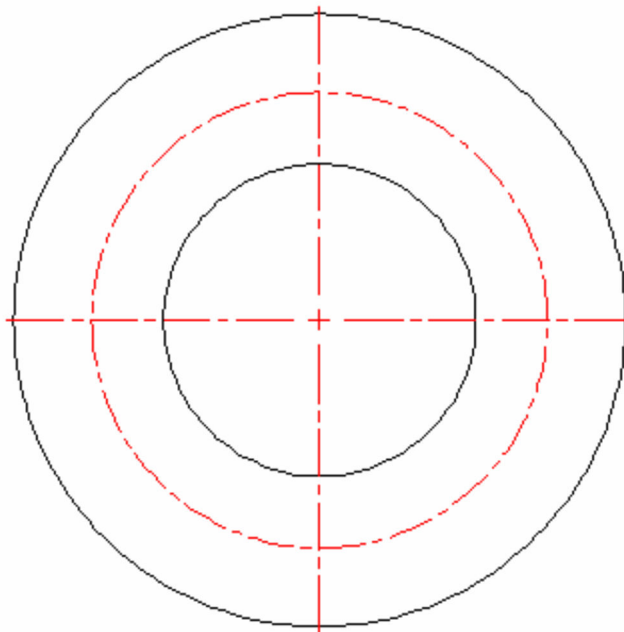


Pick about 1/8" above the center point for the start point of the line.

4. Drag the mouse vertically until you are about $1/8$ " outside of the outer most circle as illustrated:

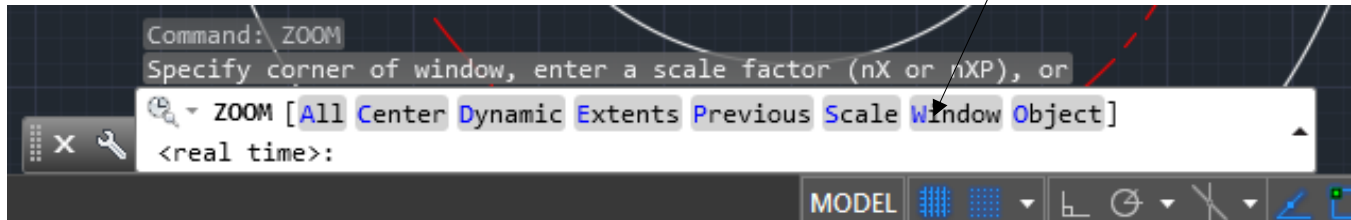


5. Draw the other vertical line and the two horizontal lines following the same procedure until the four center lines are drawn.

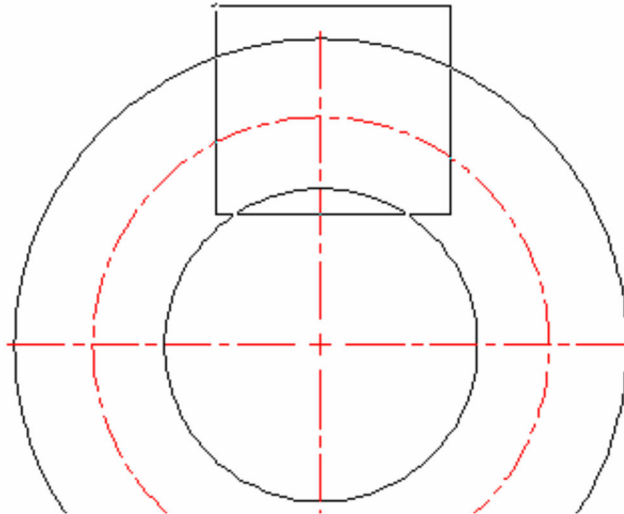


Changing the Snap Setting

1. Type Zoom and press Enter. Type W and Enter.

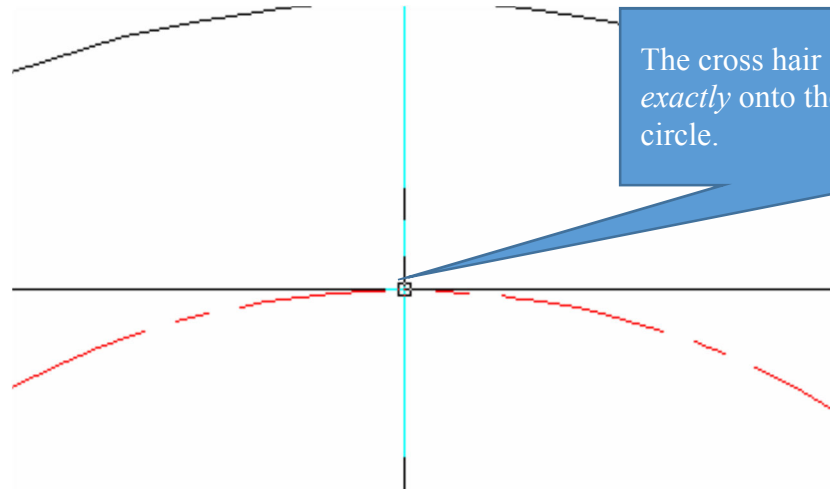


2. **Drag a window** around the **following area**:



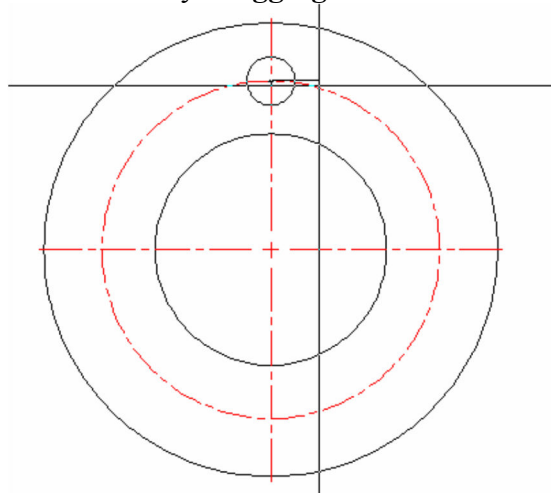
3. When you **move the mouse notice** that the **cross hair will not touch the intersection** of the **vertical center line** and the **center line circle**. The **circle** has a **radius in 1/16 of an inch**. The center point of the 5/8" diameter circles is the point where these two lines intersect.
4. **Change the snap to 1/16**. Click the **Command prompt window** and **type snap**.

5. Press the **Enter** key and type **1/16** in the **command** prompt **window**. Notice that the window indicates that the snap is 1/8. When you **key in 1/16** and **press the Enter** key, the **snap** will be **changed**.
6. Position the mouse now where the **circle** and **vertical line intersect**. The cross hair should now move exactly onto the intersection.

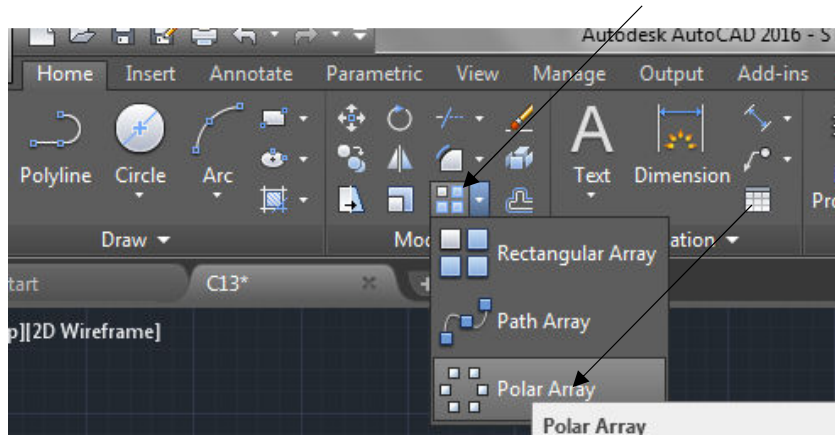


Command: Polar Array

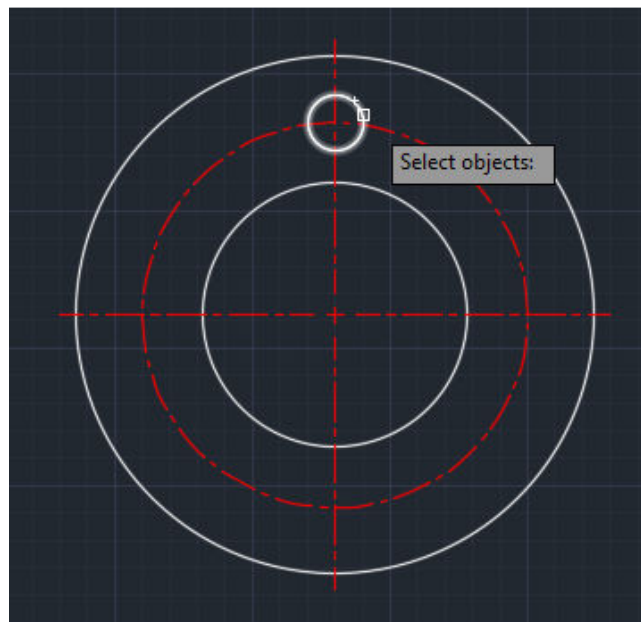
1. **Change** back to the **object layer** for the next step. When you drew the **checkerboard** drawing you used the **Rectangular Array** command. In the next steps, you are going to **draw a 5/8" diameter circle** and **copy the remaining seven circles** using the **Polar Array** command.
2. From the **Draw** menu, select the **Circle** command and **Center, Diameter**. Position the mouse onto the **intersection** of the **top vertical center line** and the **center line circle**. **Draw the 5/8" diameter circle** by **dragging the mouse** to the **correct diameter**.



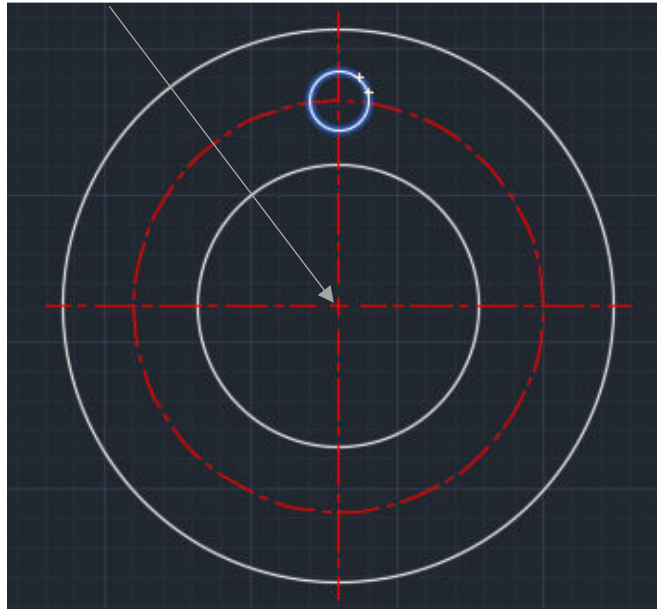
1. When the **Status** line reads **5/8"** pick the **button**.
2. **Activate** the **Polar Array** command from the **Home Ribbon Bar**.



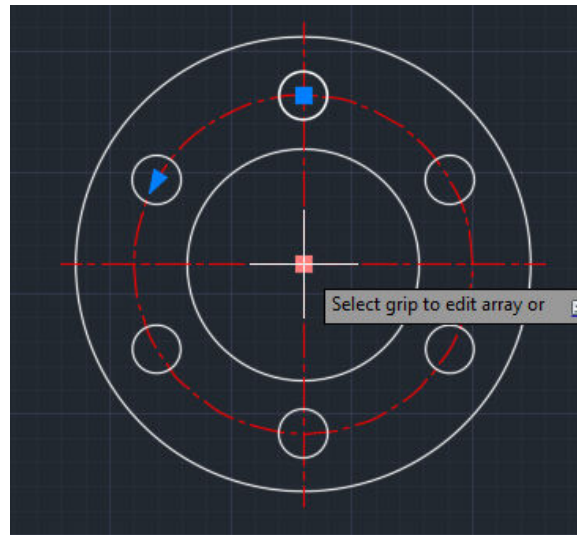
3. Select the 5/8" circle, press Enter.



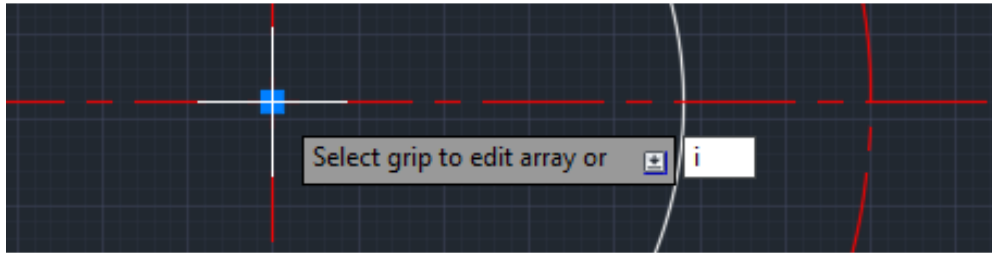
4. Select the Center point of the larger circles.



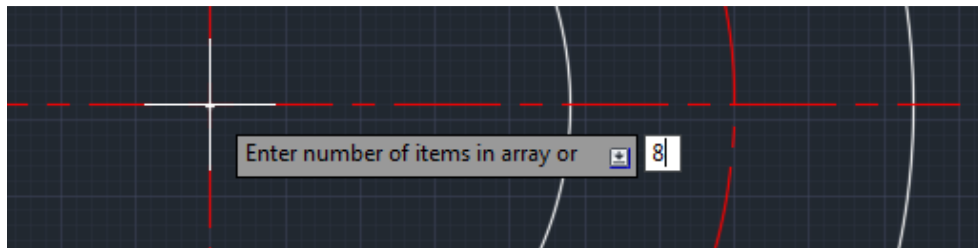
5. The Screen should look like below:



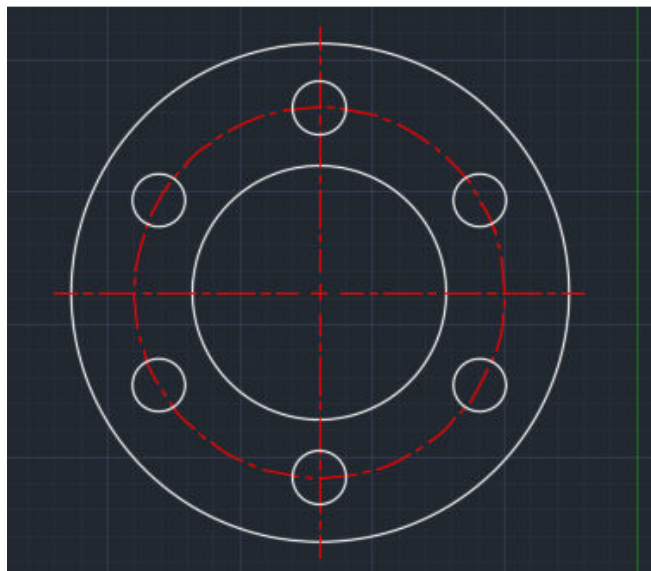
6. Type I (for item) and Enter 8, then Enter.



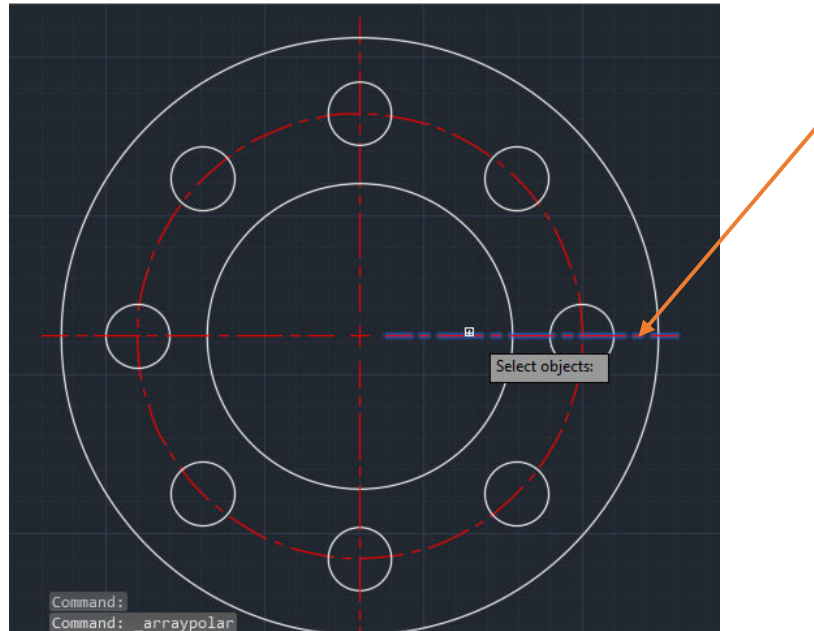
7. Change the number of items to 8.



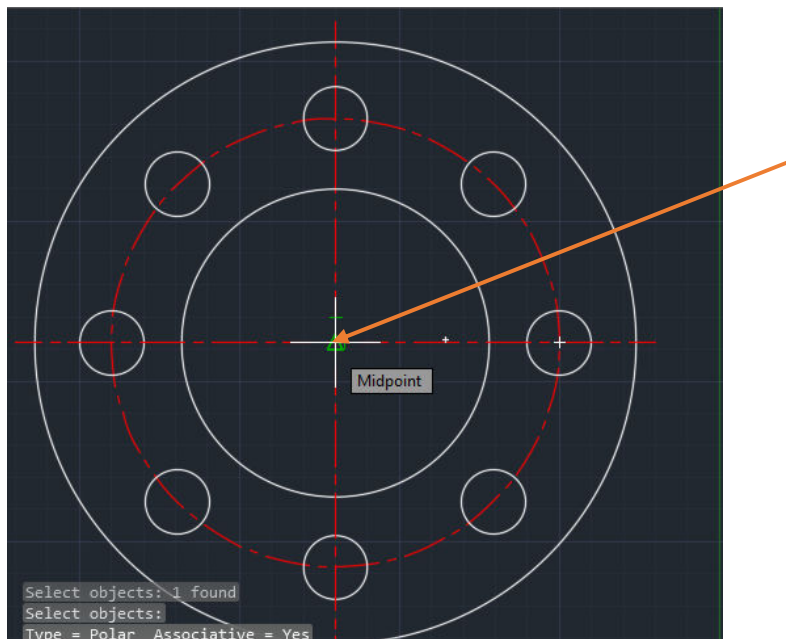
8. Press Enter twice to Exit. Your screen should look as below:



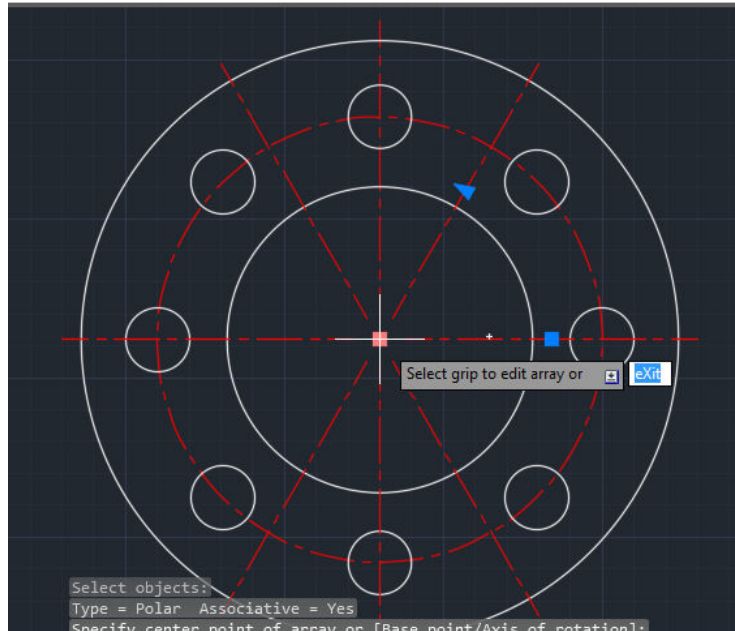
9. You will **repeat** the **polar array** command this time to array the **center lines**. Pick the **select objects** button and **select the one of the center lines**. Press **Enter**.



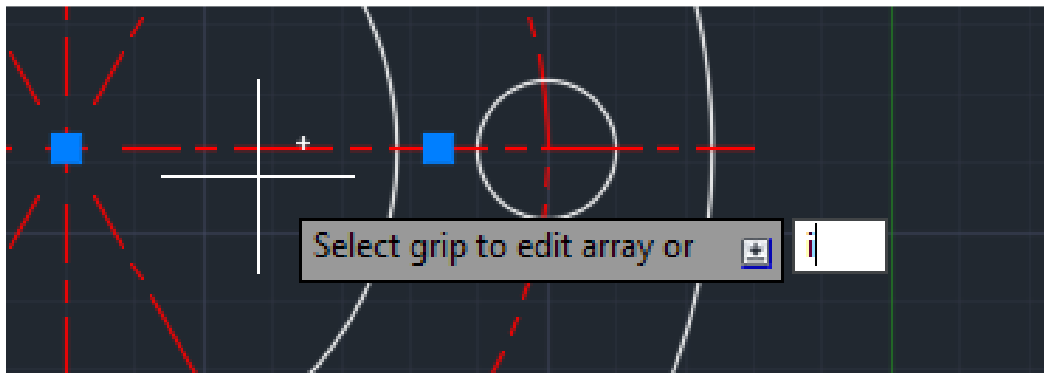
10. Click on the Center Point of all three larger circles.



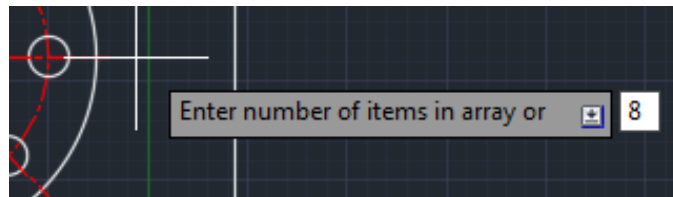
11. The screen now looks like below:



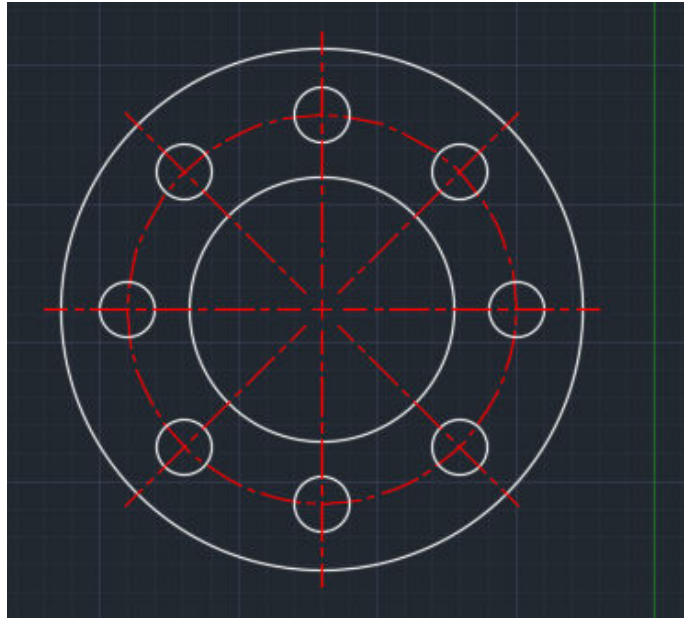
12. Type I and then Enter.



13. Type 8 and then Enter.

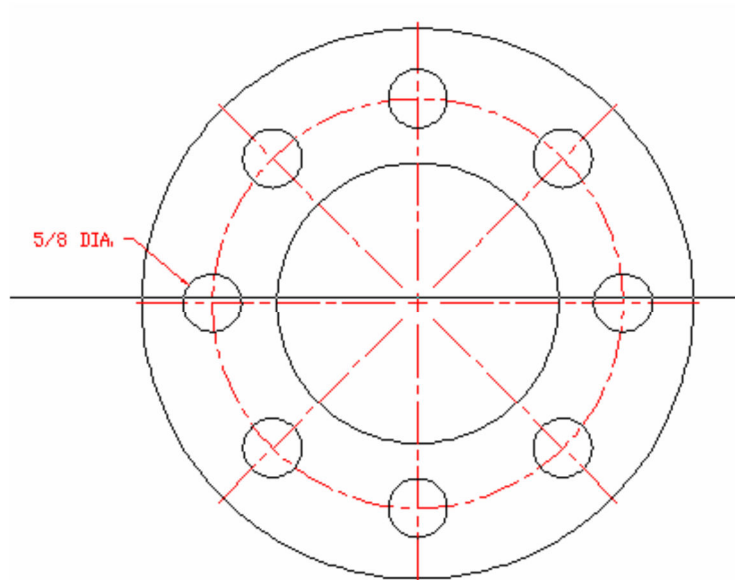


14. Type Enter again to end the Array command.



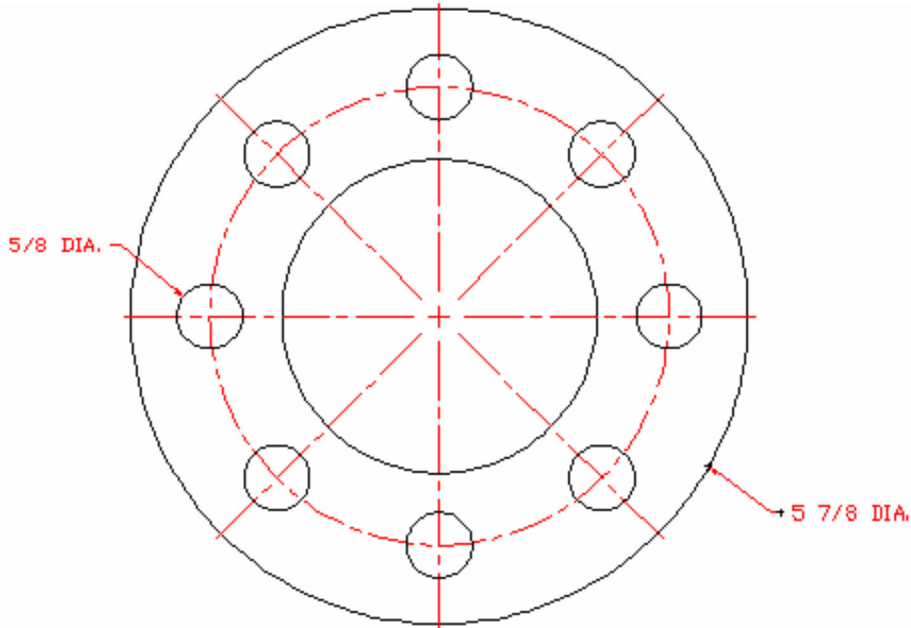
Command: Polar Array

1. Change layers to make the **Dimension** layer active.
2. Use the **leader command** and dimension the **5/8" diameter circle** as illustrated.



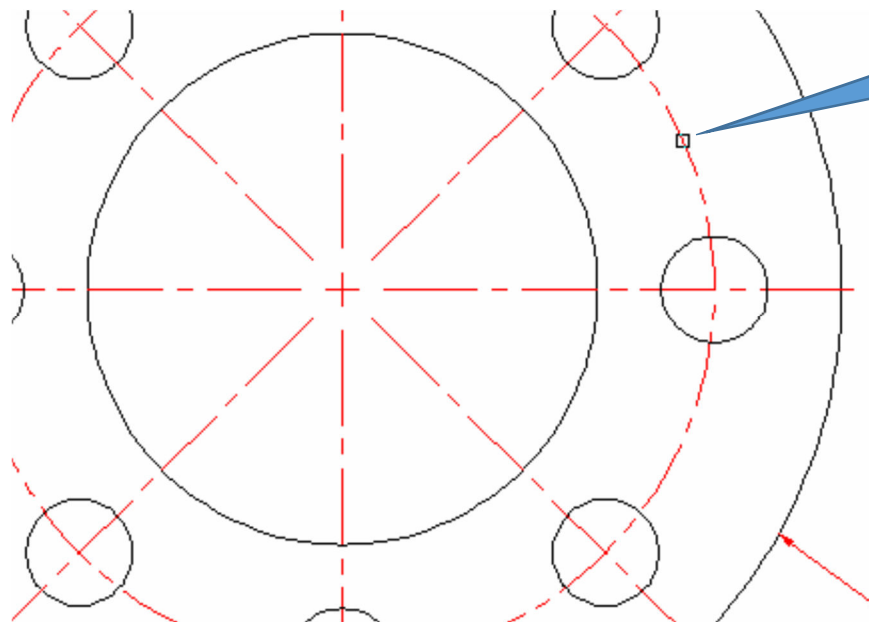
Note: When you select the first point of the leader touch the circle and drag the mouse outside of the large circle to pick the second point of the leader. Press Enter twice and then type the annotation 5/8 DIA. Press Enter two more times and the text and the leader appear.

- Also, **place a leader** onto the **5 7/8 DIA. circle**.

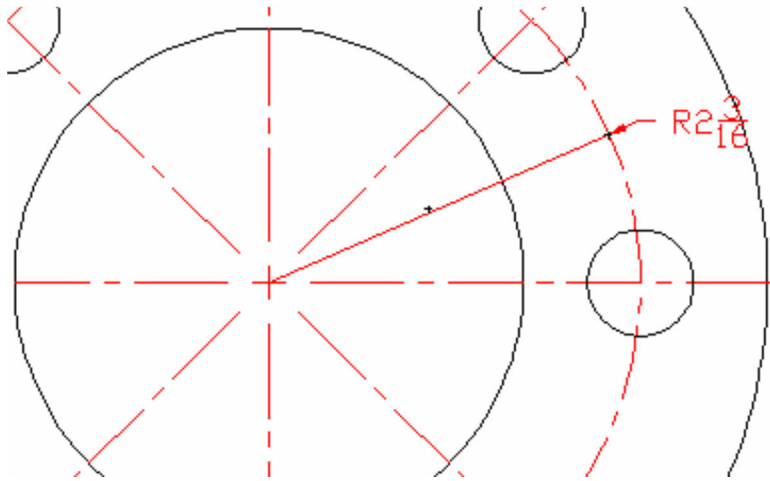


Note: leaders should always point toward the center point of the inner circle.

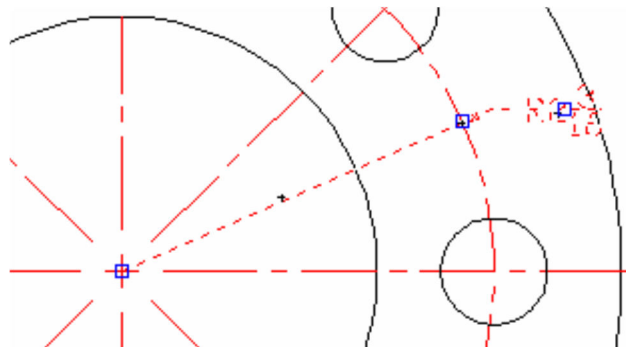
- From the **Dimension menu** select the **Radius command**. When the pick box appears locate the **crosshair** onto the **center line circle** as illustrated:



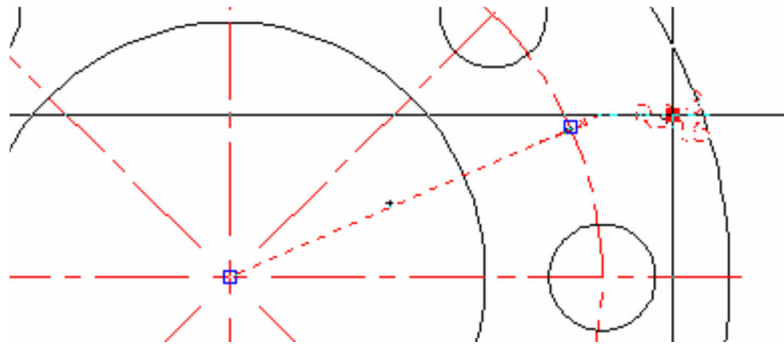
5. Pick the circle and press the **Enter** key. The text **appears**, but it is **difficult to read** because it overlaps the outside circle.



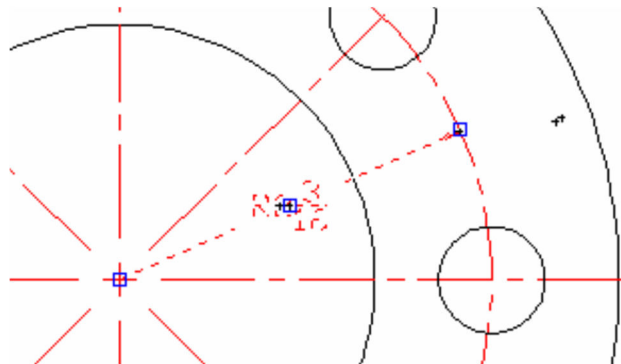
6. **Move the crosshair** onto the text **R2 3/16**. Pick the **mouse button one time**. After you **pick the text** notice the **blue handles** that appear on the text and **dimension lines**.



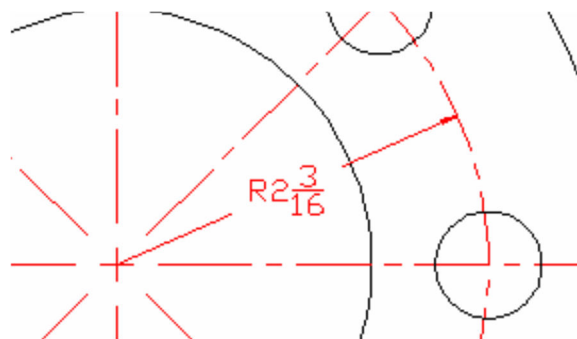
7. As mentioned in an earlier drawing, you were told that these **blue handles** are called **grips**. Click **the grip** that is located on **top** of the **text**. Notice that this **grip turned red** while the other two remained **blue**.



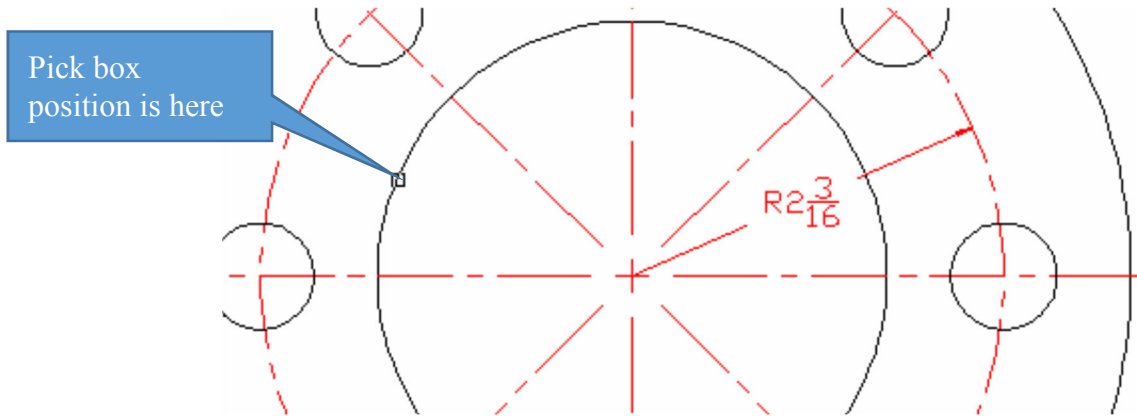
8. **Move** the **cross hair** and you will see that the text **attached** to the **red grip** is **now moving**. **Reposition** the **text** to the **location** shown and **pick** the **mouse button**. The **text** should be moved to this **new location**.



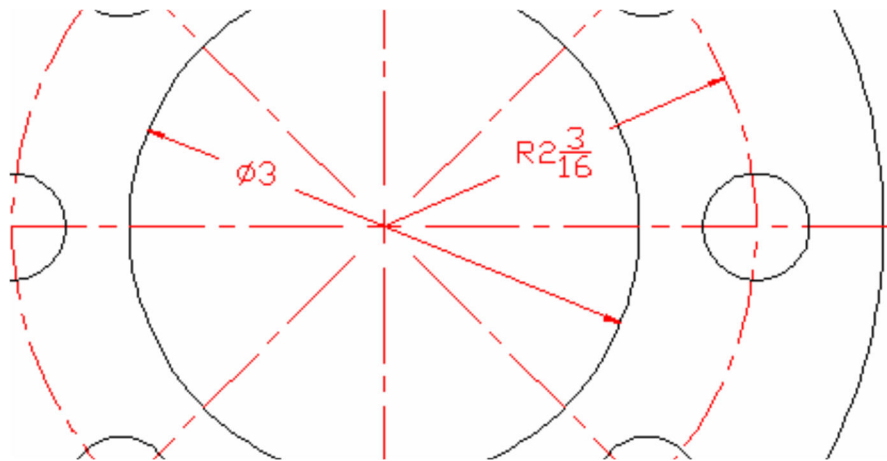
9. Press the **Enter** key one time and the text will be moved as shown:



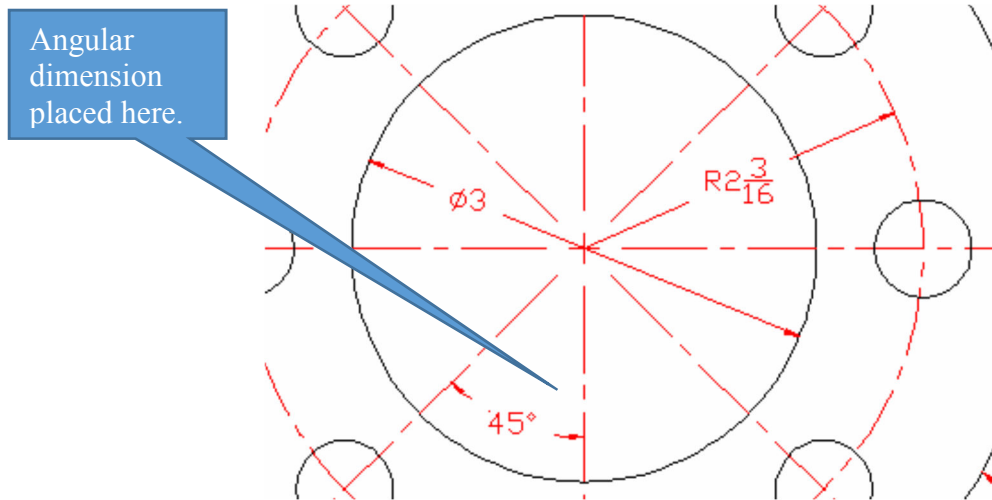
10. The next step is to dimension the **3”diameter circle**. Select Diameter from the Dimension menu and then pick the 3” diameter circle in this area.



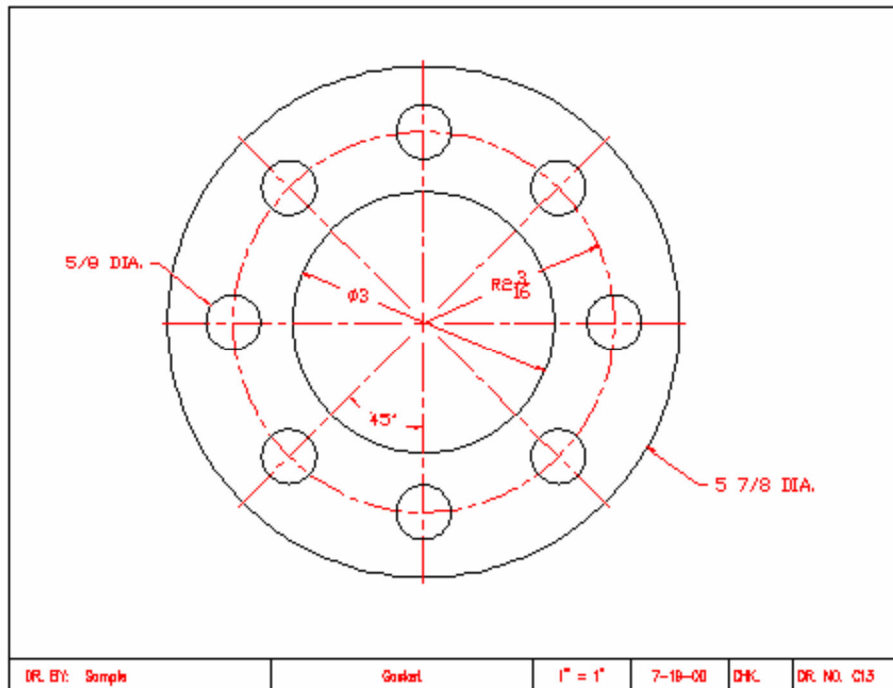
11. You will need to **reposition** the 3 to the **location indicated below** the same way you did on the radius dimension.



12. Select the **Angular dimension command** that you learned about earlier drawings and **complete the dimensions**.



13. The drawing should now be completed. **Check your assignment** with the golden rod sample.



Terms to Know

Center Point
Dim Diameter
Polar Array

Circle
Dim radius

Dim Center
Grip