

Chapter 11

Dimensioning the Bracket Problem

In this chapter, you will learn the following to World Class standards:

- **Dimensioning a Multiple View Drawing**
- **Placing Center Marks on a Multiple View Drawing**
- **Placing Linear Dimensions on a Multiple View Drawing**
- **Placing Radius Dimensions on a Multiple View Drawing**
- **Placing Diameter Dimensions on a Multiple View Drawing**
- **Discussing the Difference Between 2D Model and Sheet Space**

Dimensioning a Multiple View Drawing

When learning how to dimension a multiple view drawing, the goal is to portray a clear and concise visual representation of the part or assembly. A great rule of thumb is to place the dimension in the view which the part is facing when the machining or construction practice is in progress. For example, if a worker is drilling four 14 mm holes in the top plate of the bracket, then draw the dimension in the top view, both the x and y-axis locations and the drill diameter. Likewise, in a forged or cast part, add the radius of fillets in the proper view so that the pattern maker can easily read the drawing and make the correct choices. Check every circle, line and arc at the end of the dimensioning process, guaranteeing that there are not any missing measurements.

For those new CAD operators with previous experience, you should already know that this bracket is missing the draft angle and the necessary fillets on the edges to prevent a poorly made casting. Manufacturing this part from stock will add an extreme amount of time to the machining process and, therefore, a large cost to the finished product. There are additional World Class CAD chapters in other texts that will discuss the intricate steps of designing a cast part, so you can believe for the present that making the bracket is a process of machining from a solid block of material.

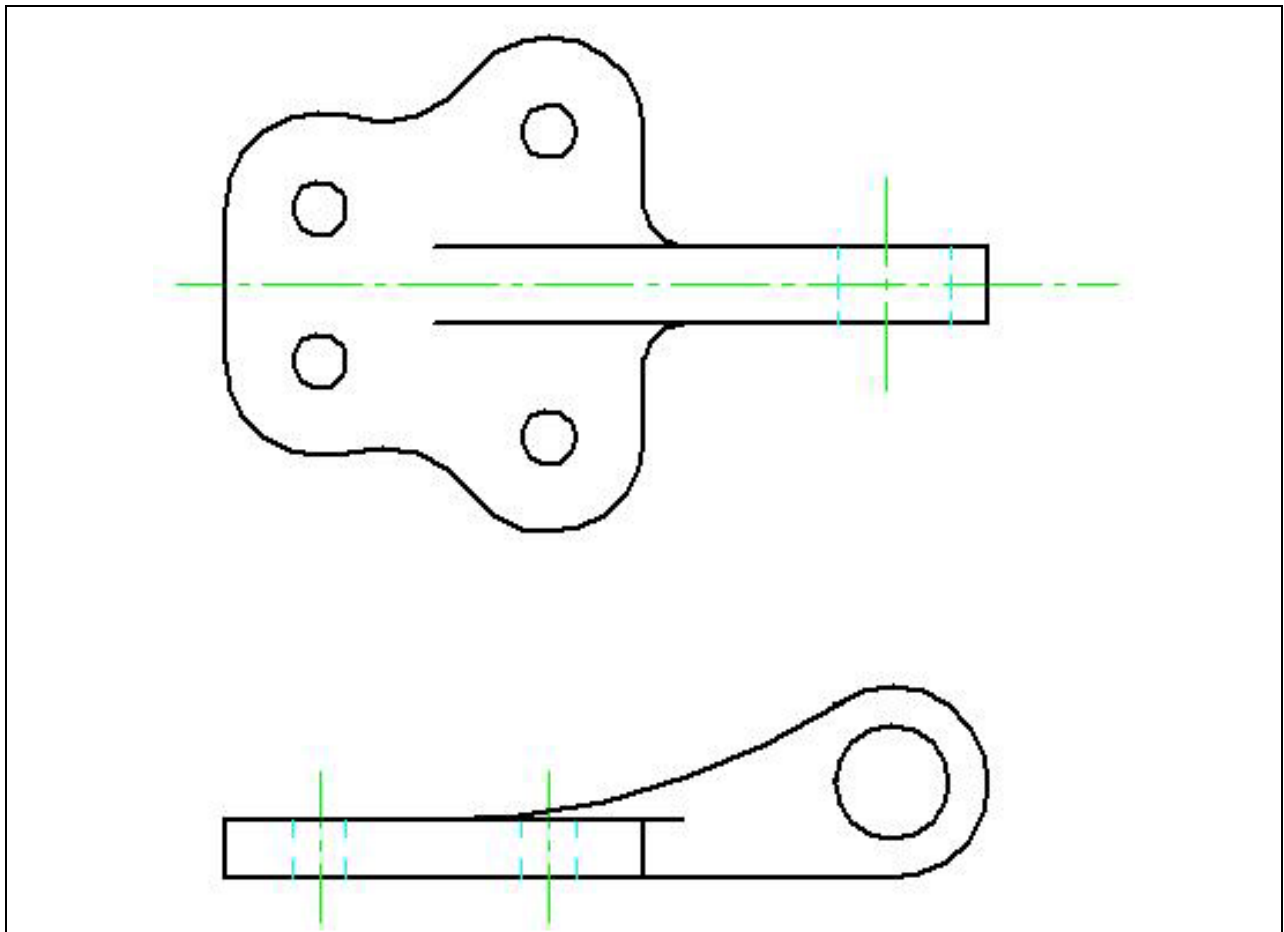


Figure 11.1 – Dimensioning the Bracket Problem

Placing Center Marks on a Multiple View Drawing

On the Layers Window that is located on the far left of the graphical screen, select the **Center** layer. You need to place center marks inside the four 7.0 radius circle and inside the loop detail in the front view. Select the **Center Mark** tool from the **Annotation** panel under the **Home** tab. Place your cursor over the circles until you see a center mark appear. Then left click with your mouse to place the center mark. You will have five center marks when you are finished (Figure 11.2).

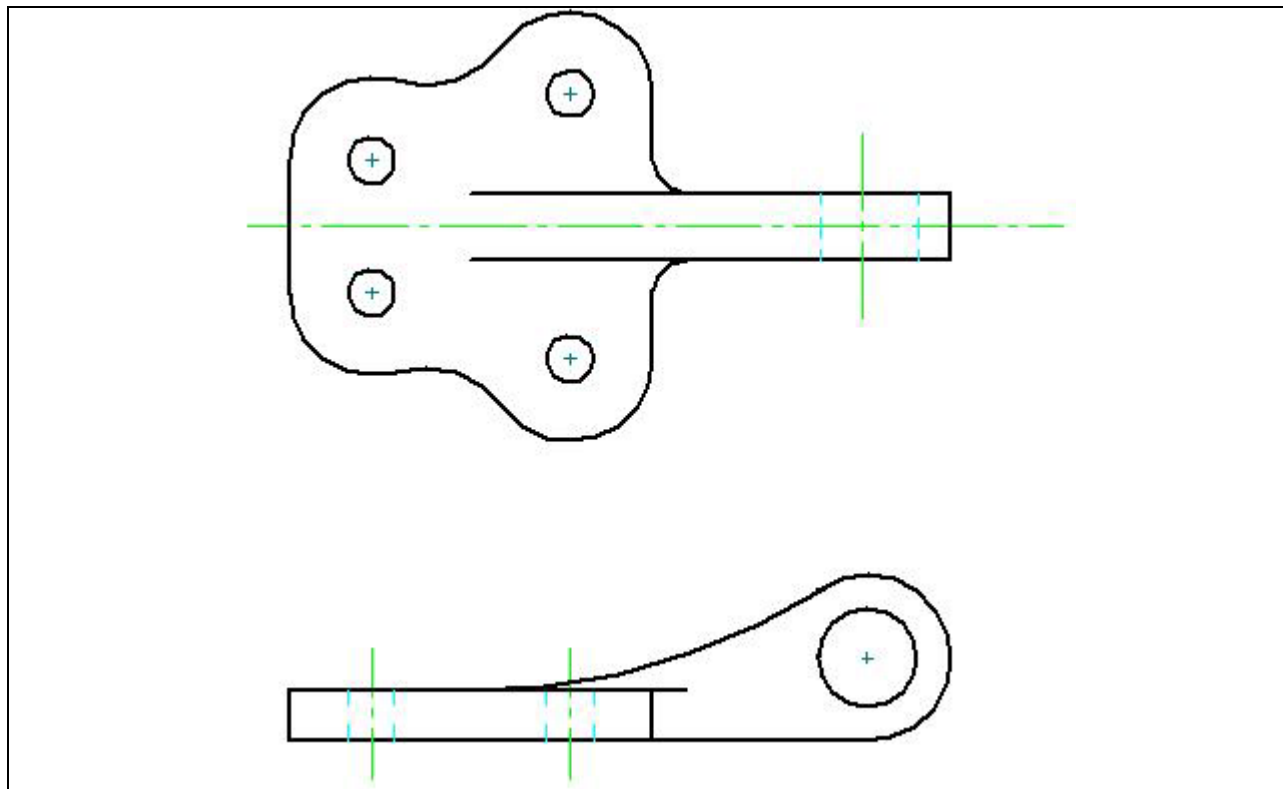


Figure 11.2 – Center Marks on the Bracket Problem

Placing Linear Dimensions with the Distance Between Tool

Change the IntelliSketch settings so that only the Endpoint icon is selected. This will stop any other IntelliSketch icons from interfering with placing your dimensions. In the Layer Window, select the **Dimension** layer. Now, pick the **Distance Between** tool on the **Dimension** panel and insert dimensions as shown in Figure 11.3. Draw a 10, 20 and 40 mm dimension coming off the centerline of the top view. Then draw 40, 60 and 80 mm dimensions between the two holes. You will have to use the “By 2 Points” setting on the **Distance Between** tool to place the 40 mm dimension here. Add the 15 and 20 mm dimensions showing the thickness of the material. Finally, add the 150 mm dimension on the front view, indicating the distance from the front hole to the center of the loop. This completes all the linear dimensions.



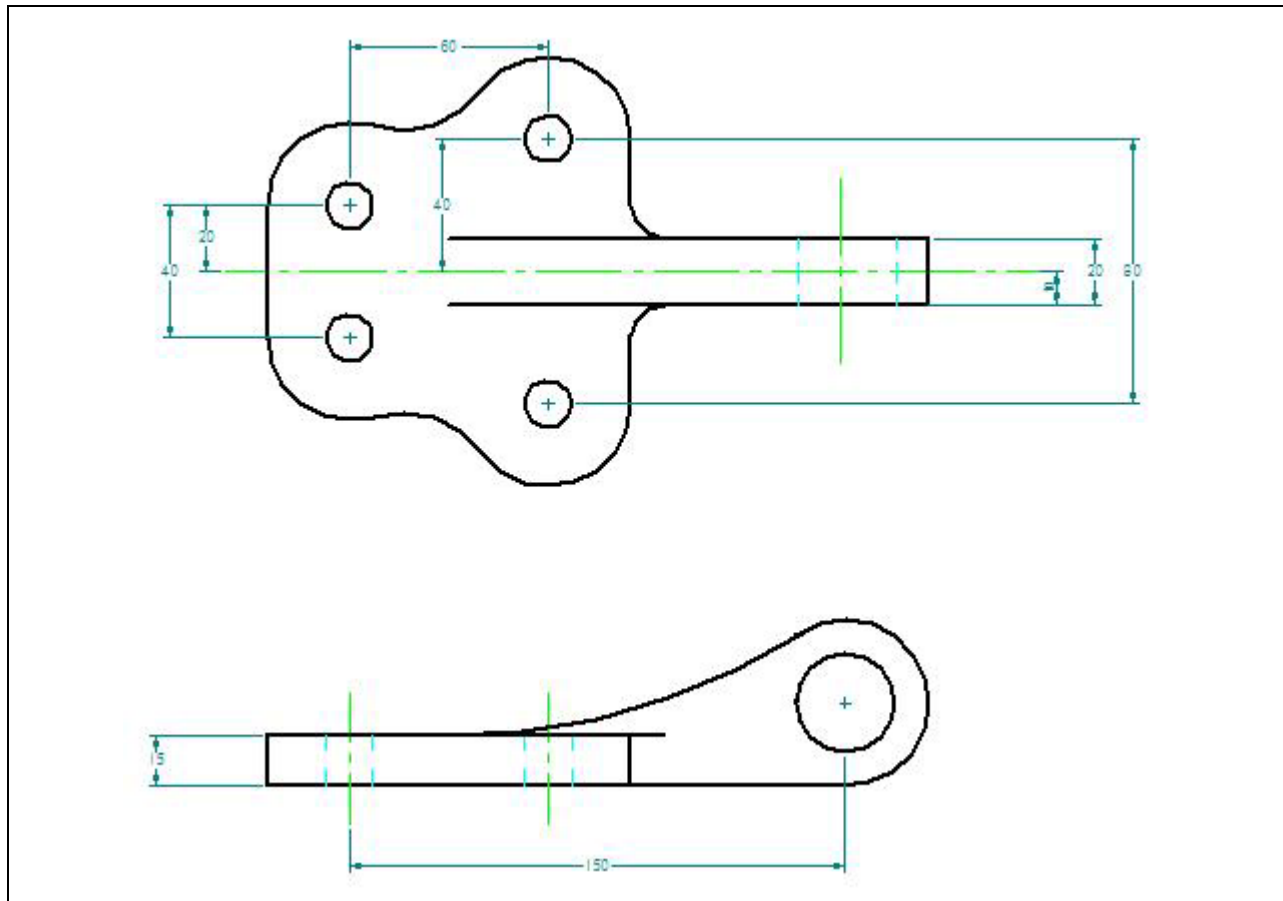


Figure 11.3 – Using the Distance Between Tool

Placing Radial Dimensions on a Multiple View Drawing

There are six radial dimensions for the bracket problem so you need to identify the four on the top view and two in the front view. Select the **Smart Dimension** tool on the **Dimension** panel. In Figure 11.4 you can see that the arcs are shown in pink. There are 10, 25, 25 and 30 mm arcs in the top view and 25 and 200 mm arcs in the front view.



On the top view, you probably want to dimension both 25 mm arcs. Since there are so many curved surfaces, not labeling every arc on one side of the centerlines could make someone mistake the detail for another dimension. Showing a centerline down the middle of the bracket's top view means that whatever you dimension on one side is the same on the other side of the line of symmetry.

Typically, you will not place dimensions inside the part since the placement of arrows, dimensions lines and extension lines could interfere with a person's ability to read the drawing. You can place the 200 mm dimension inside the part. Placing the measurement on the inside of the arc will give you a 200 mm leader so place the dimension as shown.

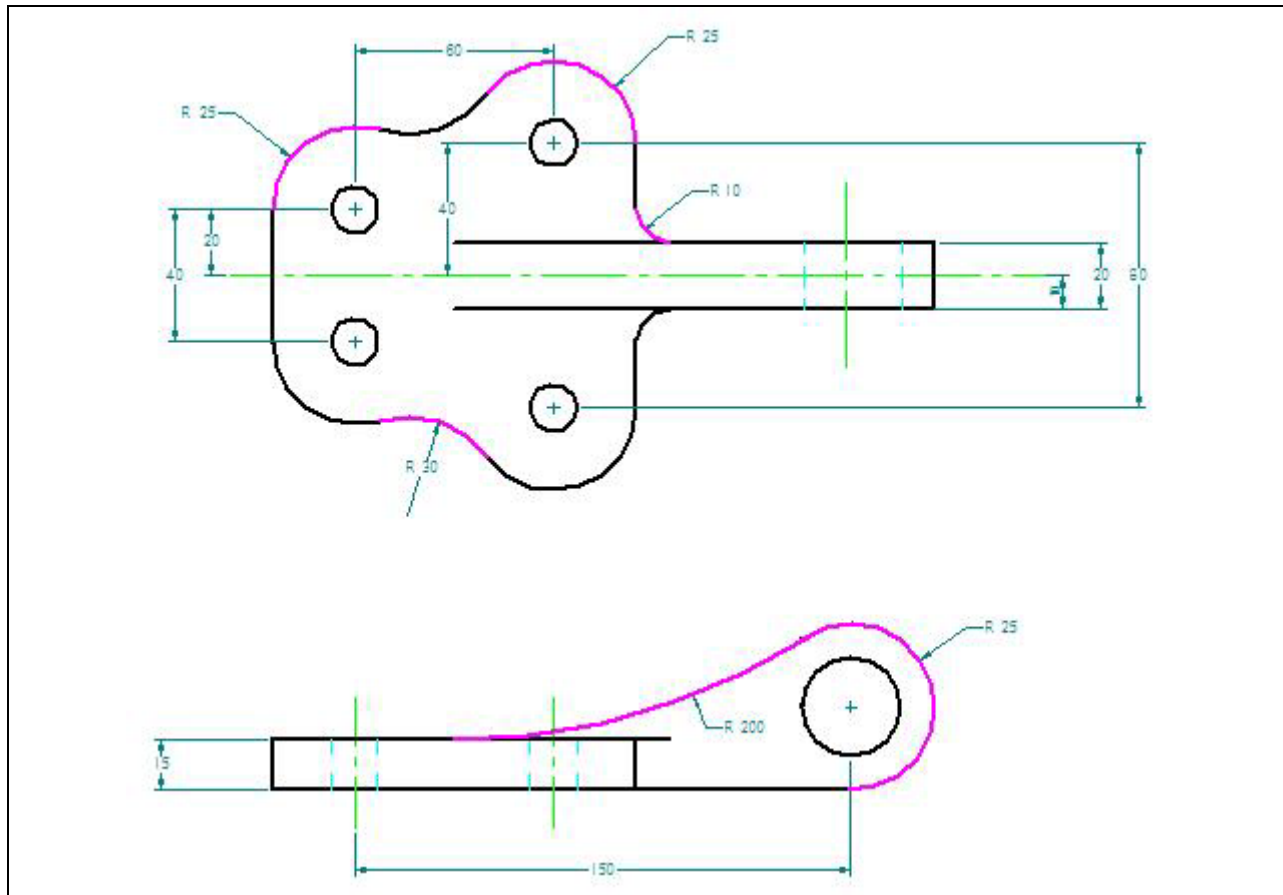


Figure 11.4 – Using the Smart Dimension Tool

Placing Diameter Dimensions on a Multiple View Drawing

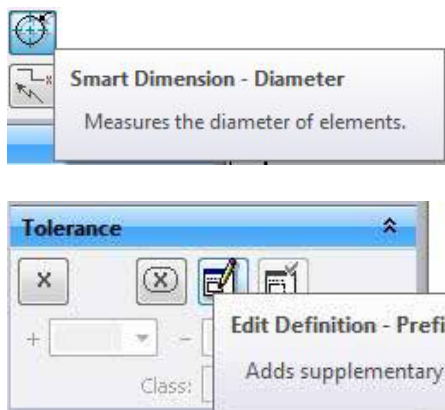


Figure 11.5 – Smart Diameter and Edit Definition Tool

There are two diameter dimensions for the bracket problem so you need to identify the one on the top view and the other in the front view. Select the **Smart Dimension** tool on the **DIMENSION** panel. In Figure 11.8 you can see the two circles shown in pink. There are 14 and 30 mm diameter circles to dimensions. You may need to select the **Smart Diameter** tool on the Smart Dimension Window to place the dimensions. After placing both dimensions in the drawing, you will want to add the text “4 holes” to the 14 mm hole diameter by selecting the dimension and then adding a suffix in the Dimension Prefix Window which you can open using the Edit Definition tool on the Smart Dimension Window.



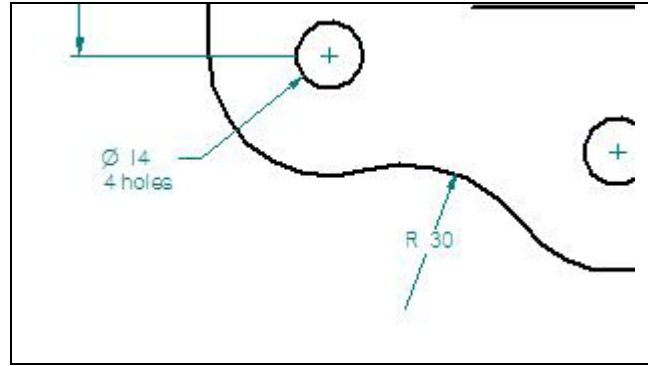
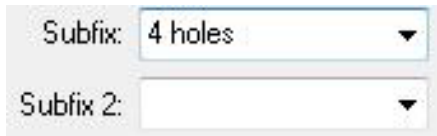


Figure 11.6 – “4 holes” Subfix

Figure 11.7 – “4 holes” Text Added

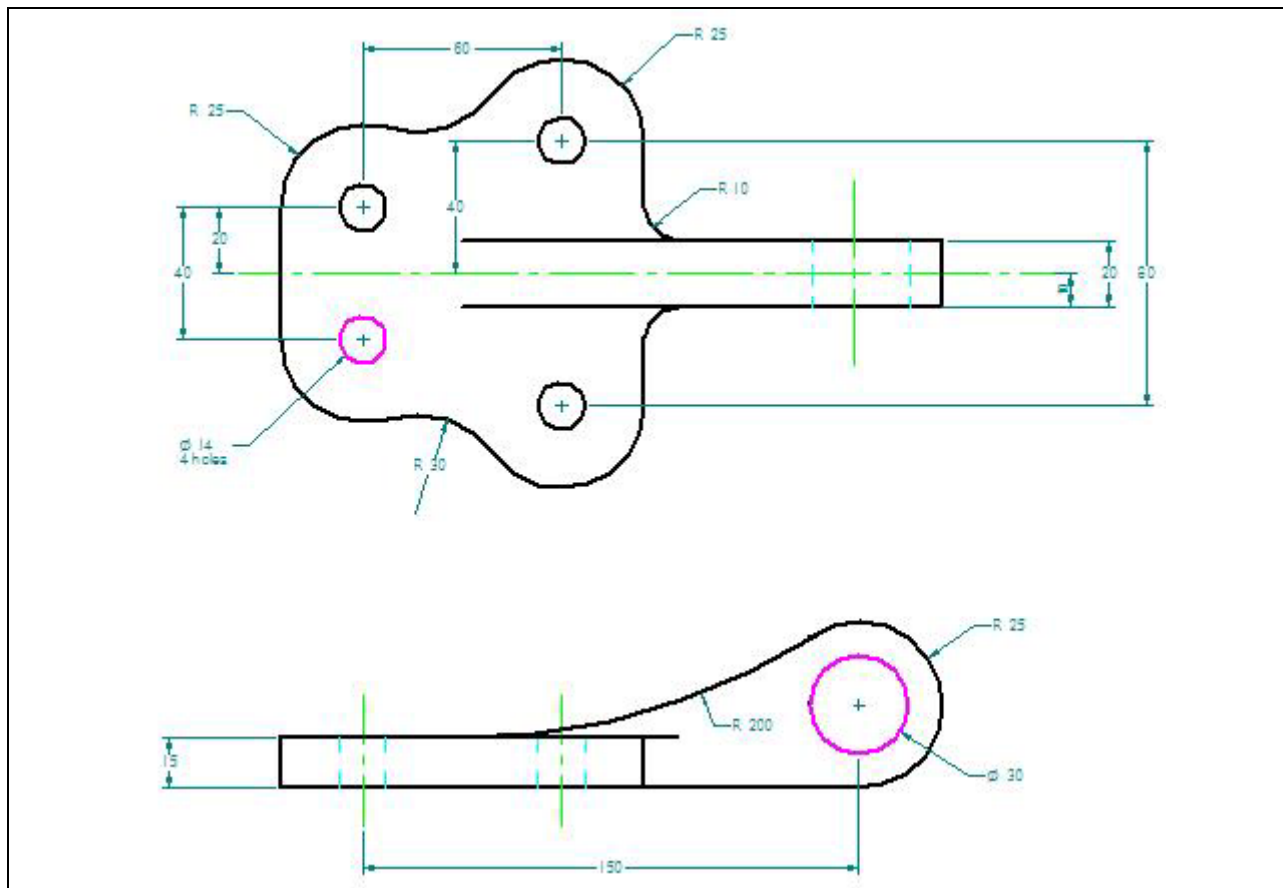


Figure 11.8 – Using Smart Dimension Tool to Add Diameters

Discussing the Difference Between 2D Model and Sheet Space

When you start a new drawing in the Solid Edge software, the program automatically takes you to Sheet space. There is a border around the graphical screen and the standard Solid Edge titleblock. However, drawing within the confines of this border is not a necessity. Within the Solid Edge program there is a drawing space called 2D Model space. To access this space, you must go to the **View** tab, and then select the **2D Model** tool on the **Sheet Views** panel (Figure

11.9). With this tool selected, a new tab will be added to the bottom of the graphical screen (Figure 11.10). It is called the 2D Model tab and you can do all the same drawings that you would normally do in Sheet space. If you want to move what you've drawn in the 2D Model space into the Sheet space, you need to select the **2D Model** tool under the **Home** tab on the **Drawing Views** panel but you also need to be working in Sheet 1 tab and not the 2D Model tab (Figure 11.11). Although it might take awhile to get used to drawing and moving objects between 2D Model space and Sheet space, there are very few, if any, new techniques that you would have to learn to use the two different spaces.

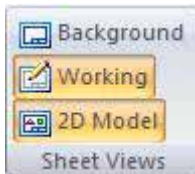


Figure 11.9

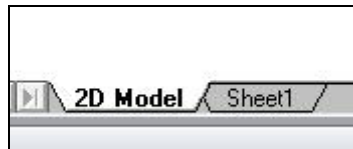


Figure 11.10

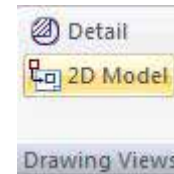


Figure 11.11

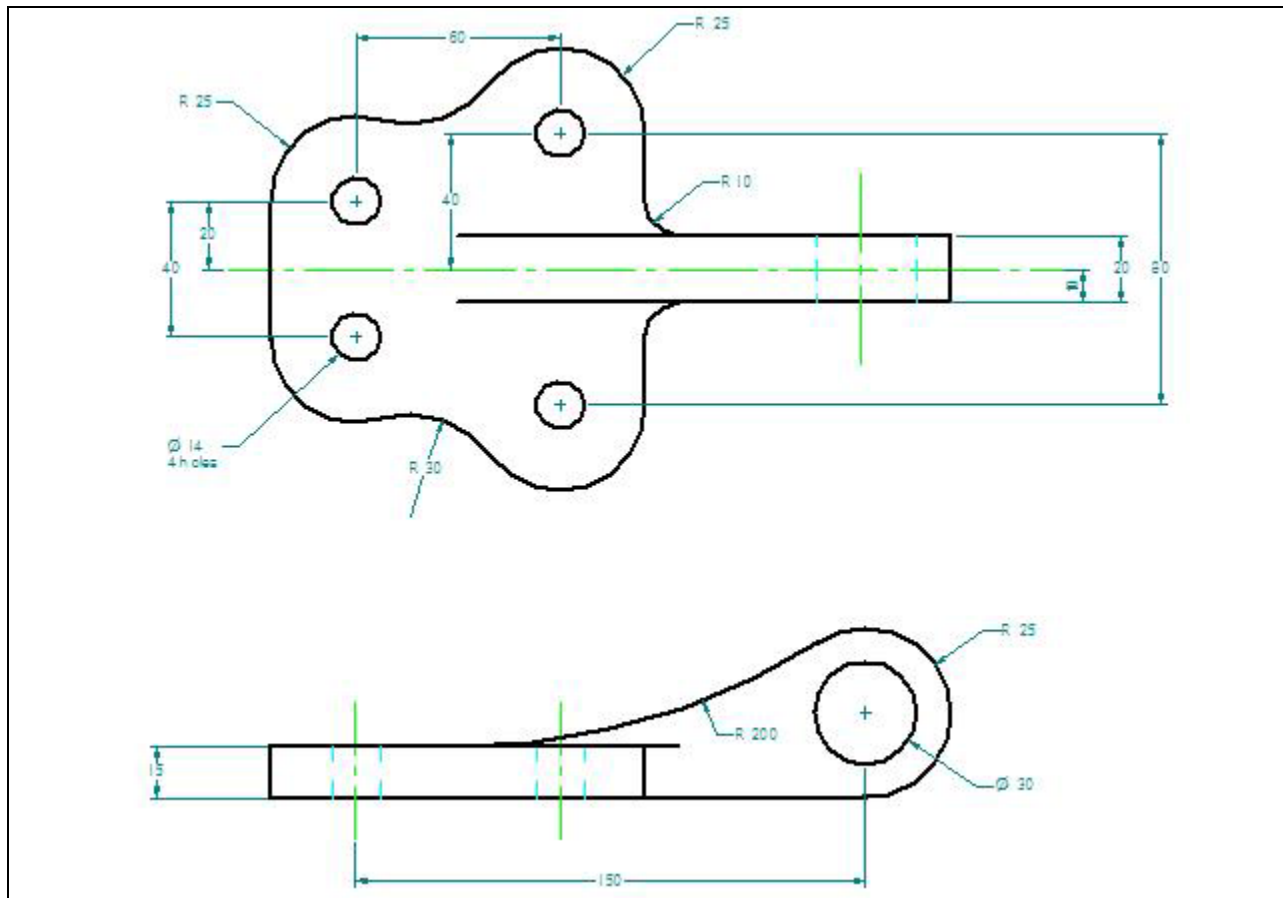


Figure 11.9 – Finished Dimensioned Bracket Problem

*** World Class CAD Challenge 22-22 * - Create a New file using the Metric template and draw the 66 entities shown in figure 11.9 in 10 minutes. Continue this drill four times, each time completing the drawing in less than 10 minutes to maintain your World Class ranking.**

