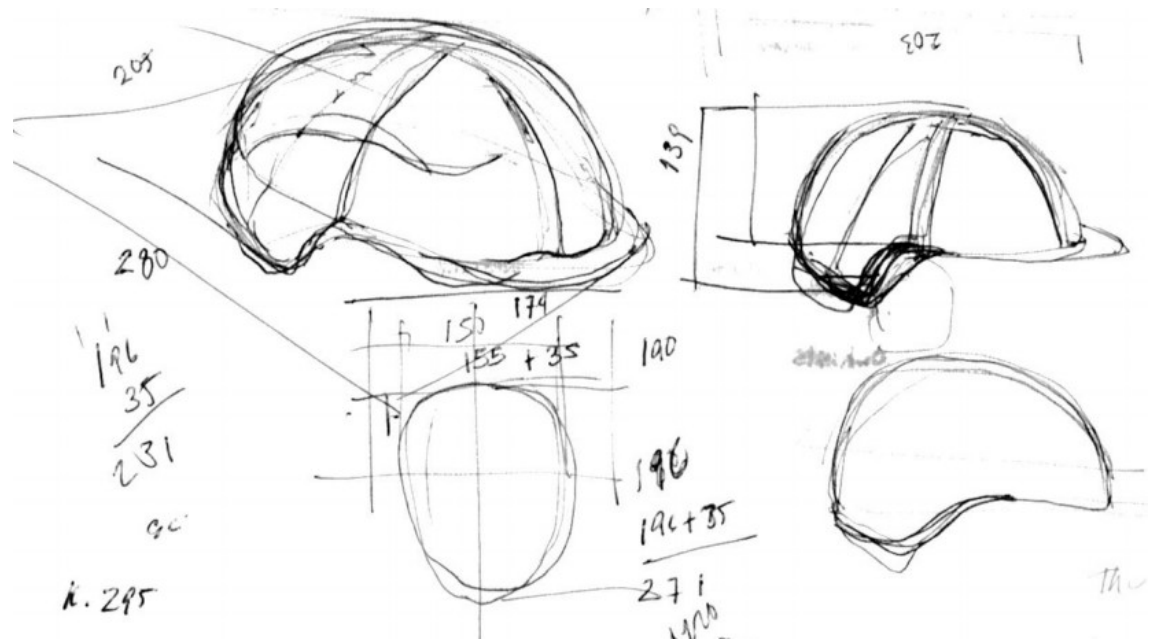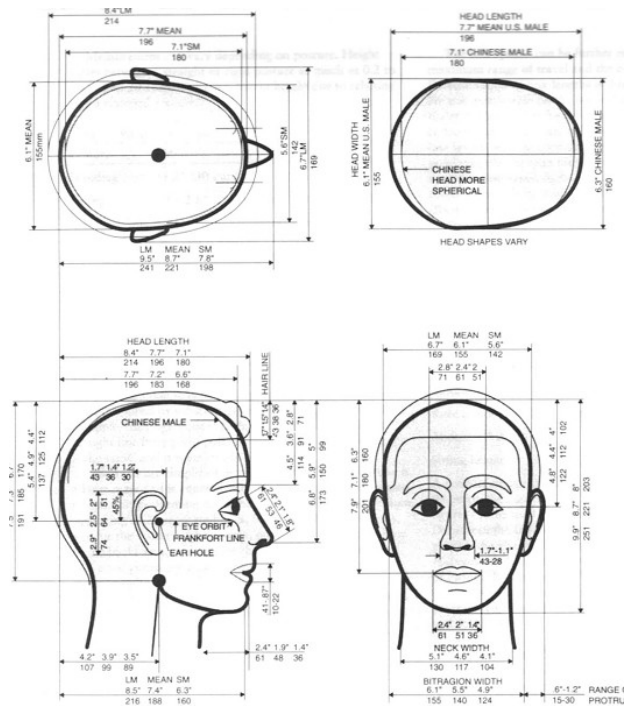# Step by step IC2013: safety helmet

This is a step by step exercise on how to model a safety helmet in IRONCAD

Let me begin by getting a reference from THE MEASURE OF MAN AND WOMAN: Human Factors in Design by Alvin R. Tilley Henry Dreyfuss Associates.
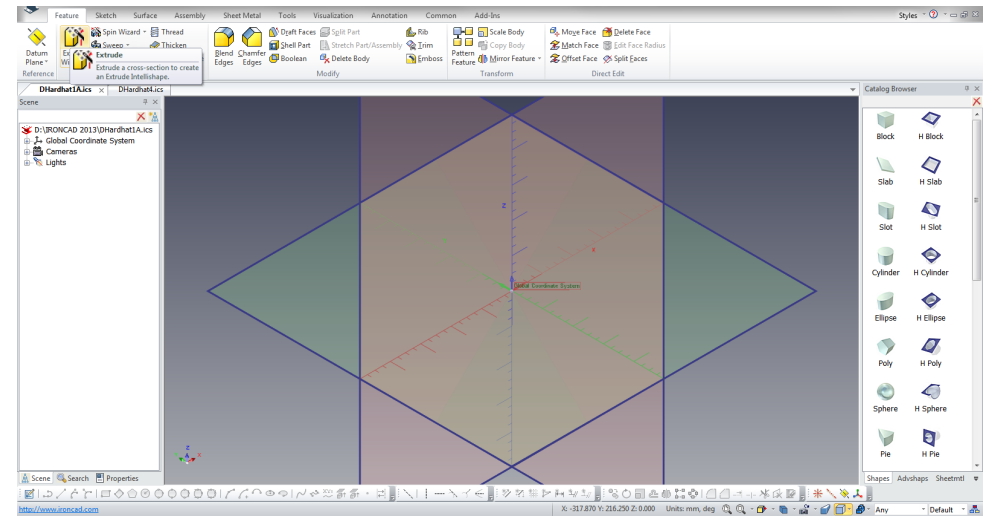

For this project, on View > Toolbars . Toolbars... > Customize window > Toolbars tab Tick from the list: 2D Construction, 2D Display, 2D Editing and 2D Technical Drawing to display.c Grid set to 25 mm for both main and 5 mm for both minor settings.
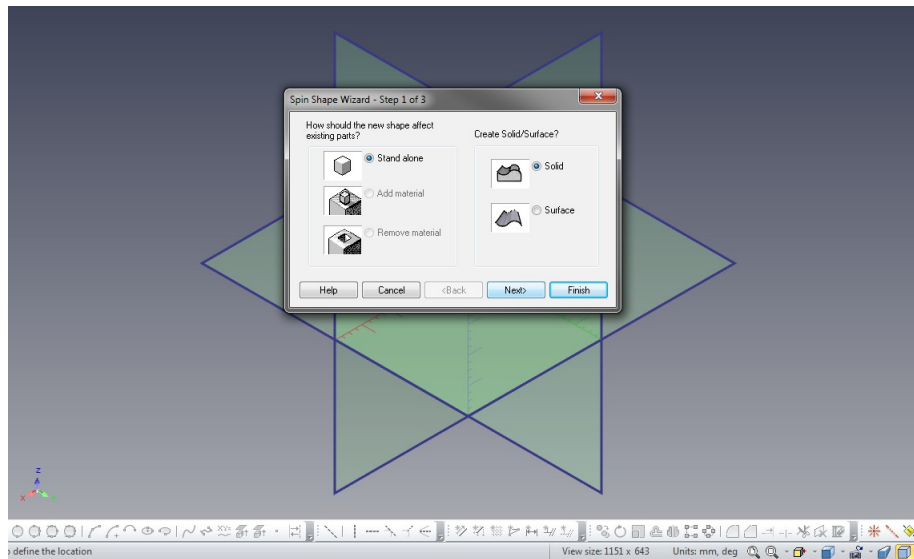
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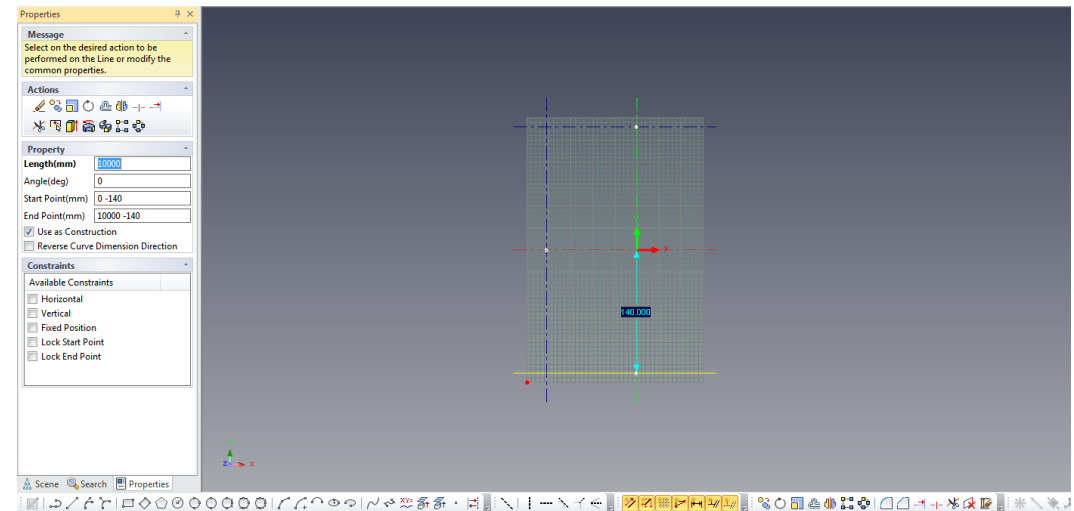Create a scene by selecting metric tab and gray datum scene.
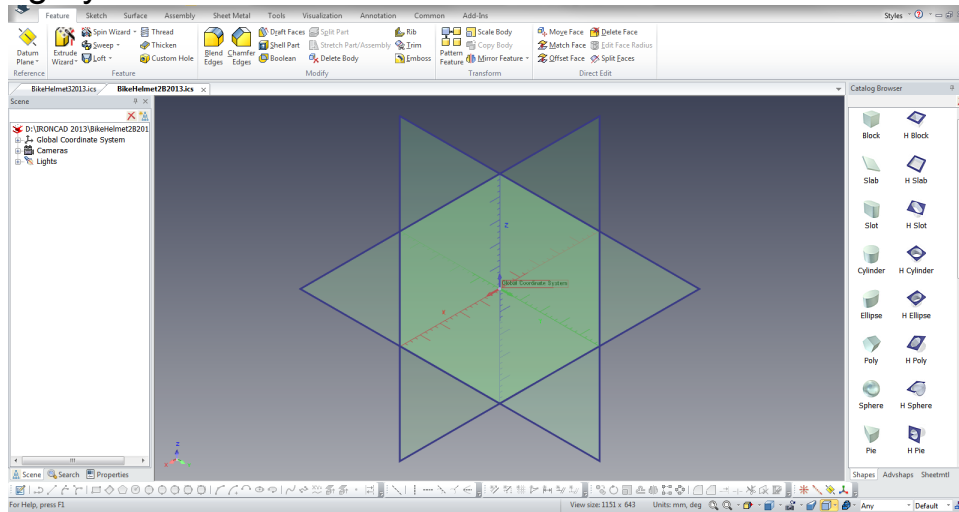
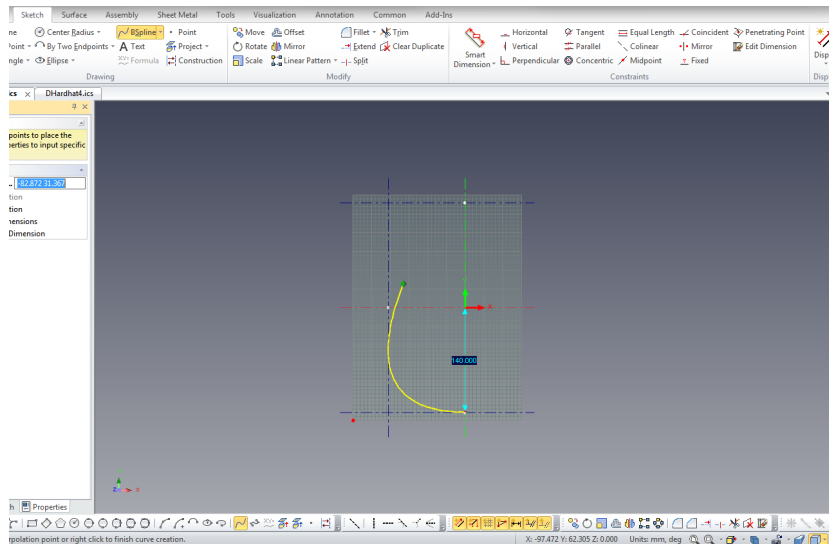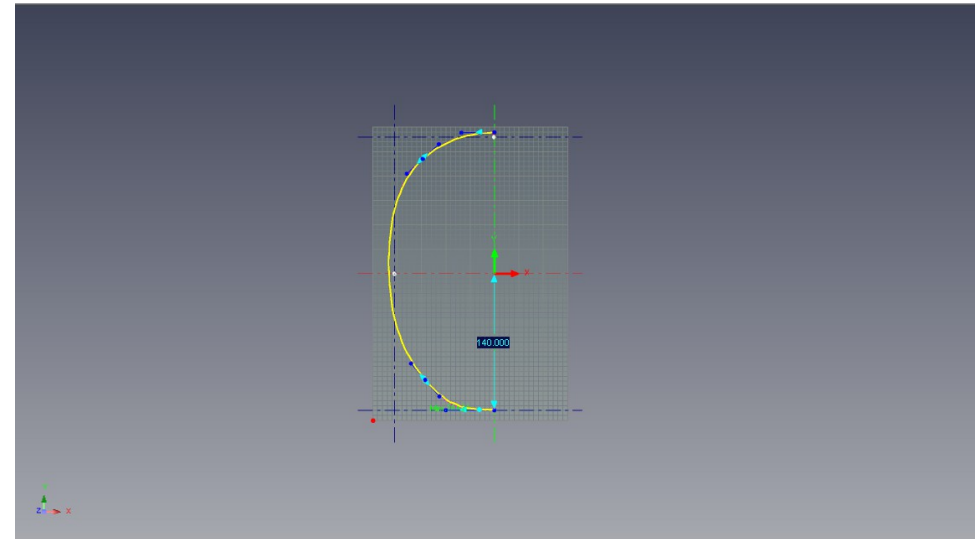Select Extrude Wizard from the Feature tab

Follow the steps on the screen

Set the horizontal and vertical construction guides from the 2D Construction Both horizontal guides at 140 and vertical at 102.5
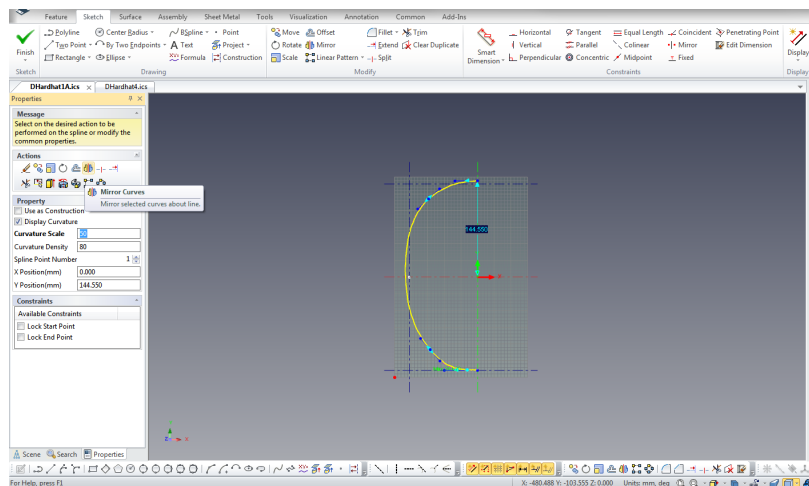

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Select B spline from the Sketch Tab or from
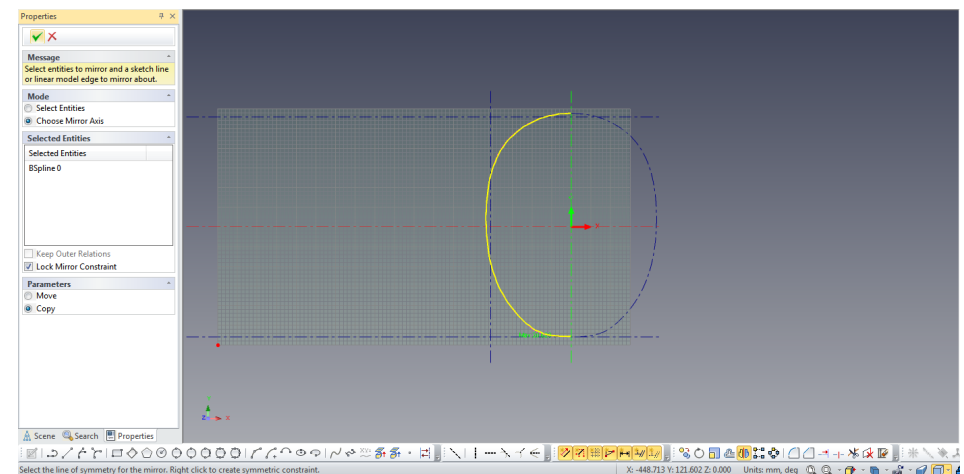the 2D construction tools bar
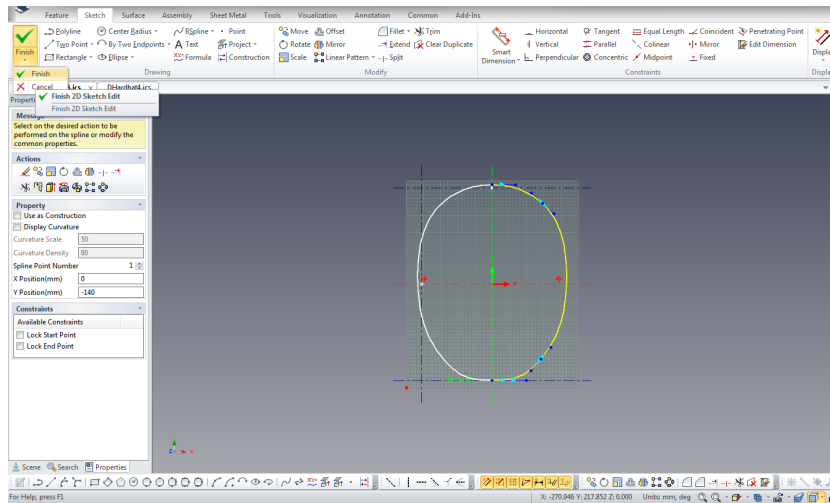

Draw the B spline as shown

Click the Mirror Curves

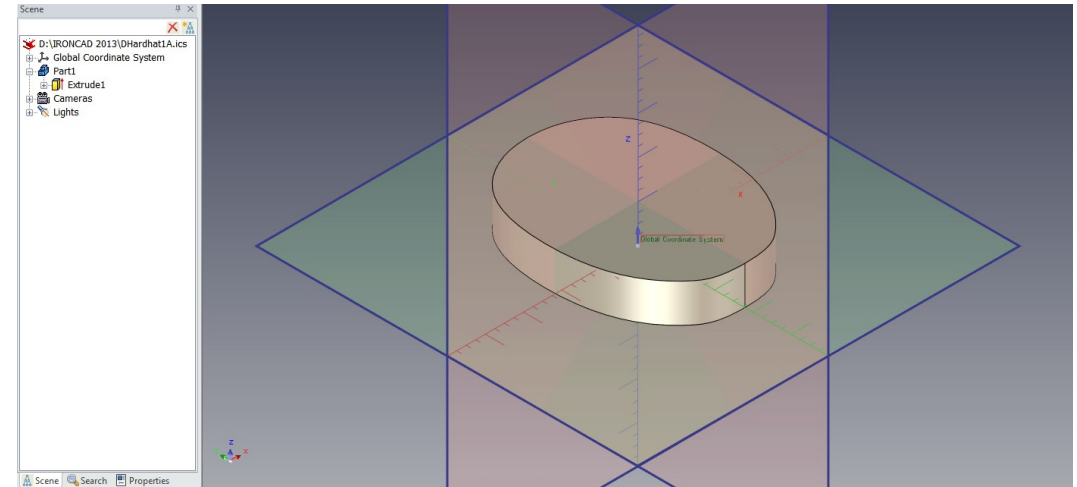Click on the center line to display copied mirror curve

You may opt to activate Display Curvature and Display Max Curvature using the right click button on your mouse.
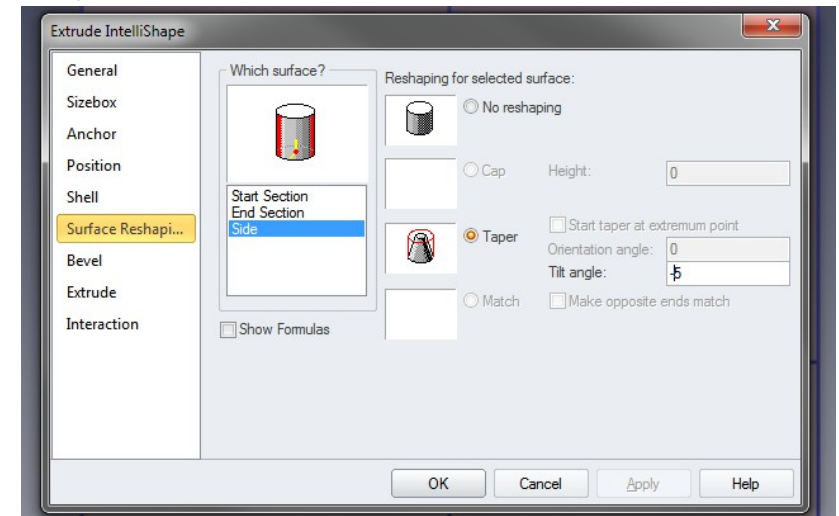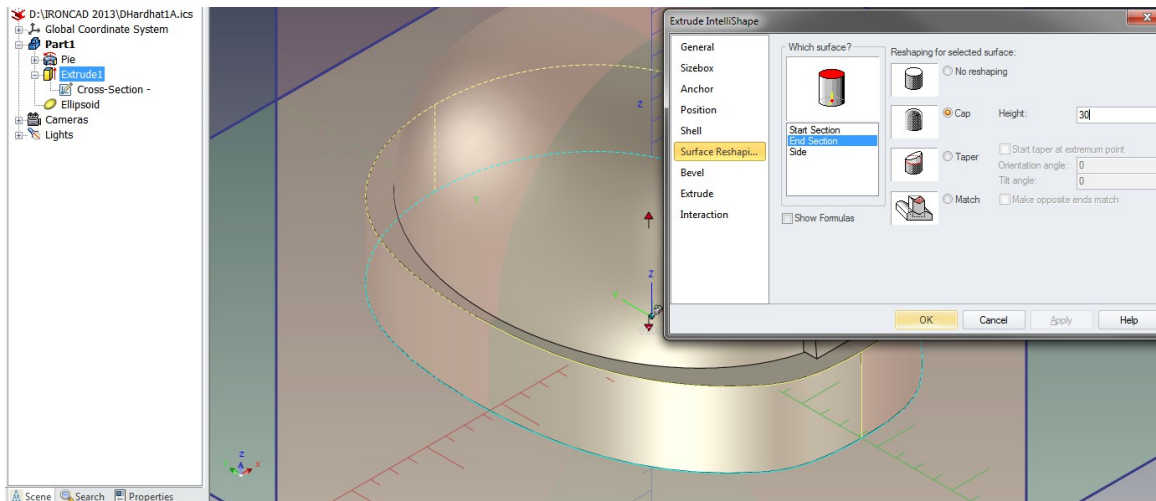
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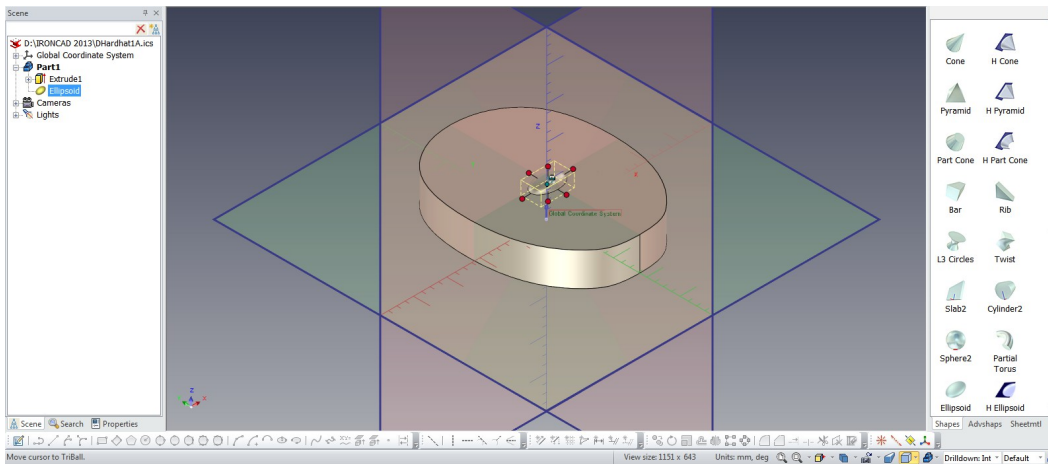Click the Finish 2D Sketch Edit upon display of the copied curve

Finished Part1

Right click part 1 from the Scene browser to edit Intellishape, left click Apply and OK
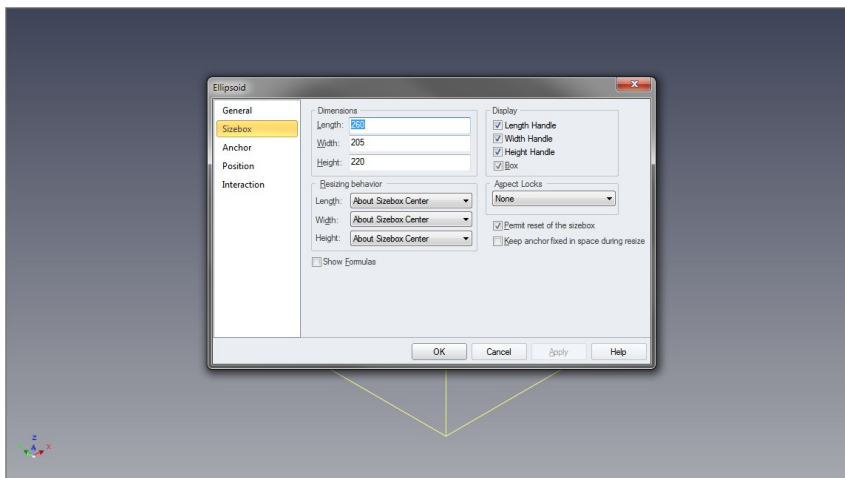

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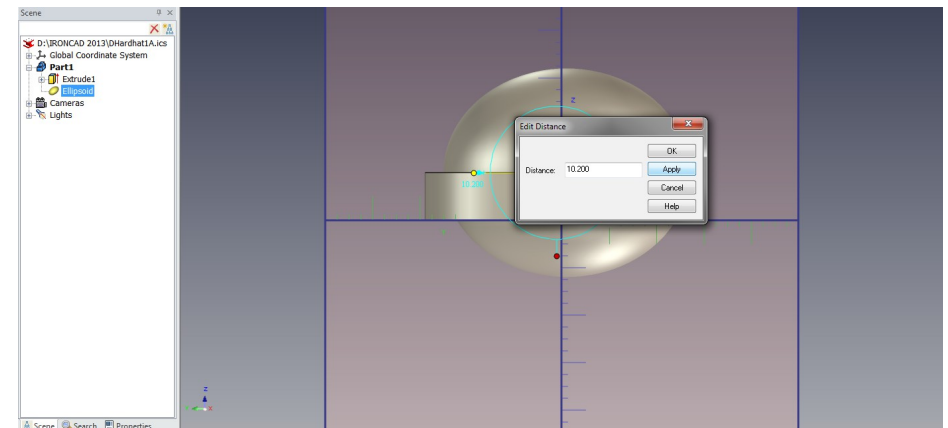Drag and drop an ellipsoid from the Shapes catalog

Select the Ellipsoid and press the F10 key to activate the TriBall and rotate part by 90 degrees to point the tip forward to the front
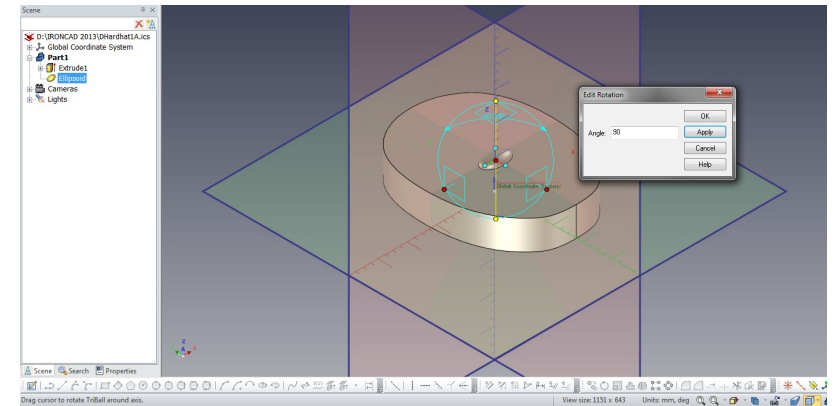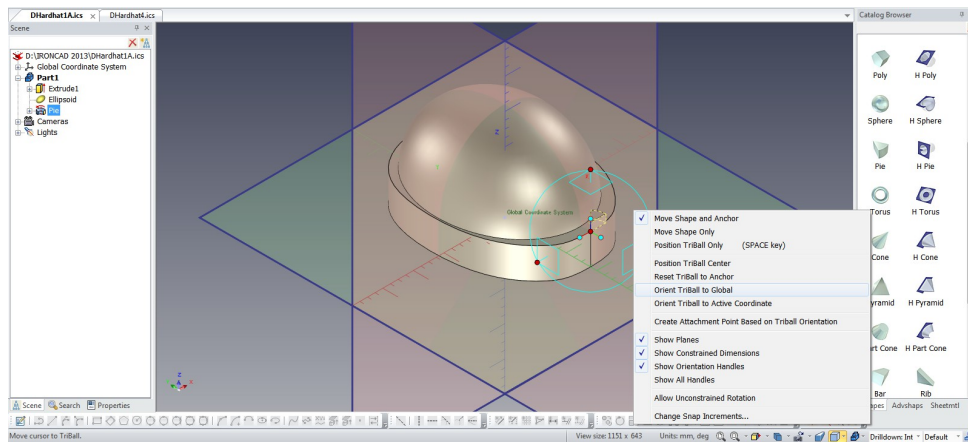

Right click the Ellipsoid from the Scene browser to edit Intellishape and apply

Select the Left view from the camera picker to change view. Press F10 to activate TriBall and move Ellipsoid 7 mm. You may visually check placement. Next slect TFL from the Camera Picker.

Drag and drop Pie from the Shapes catalog. Again press F10 for the TriBall and right click any area inside the Triball to set Orient TriBall to Global.

Right click the Pie from the Scene browser to edit Intellishape and apply
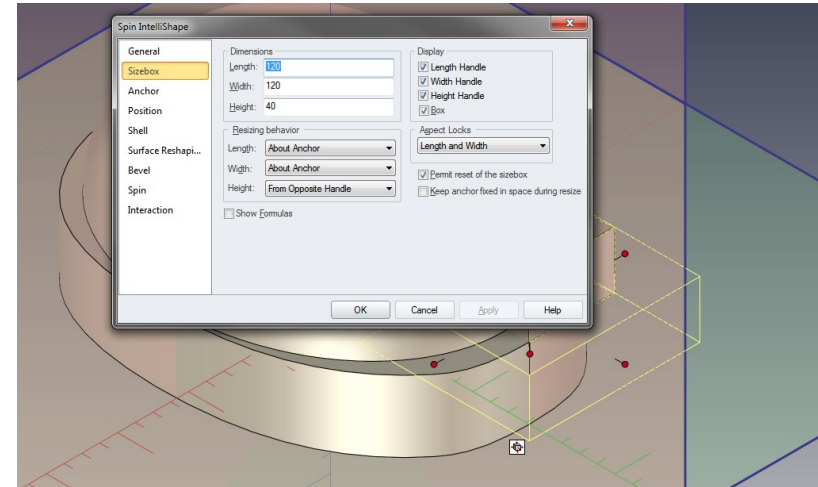

Right click the Pie anchor and use the TriBall to move 20 mm to the center of the part. Depress F10 to apply change. Press F10, this time to re-orient the axis of the Pie to 90 degrees vertical position and move to center line.
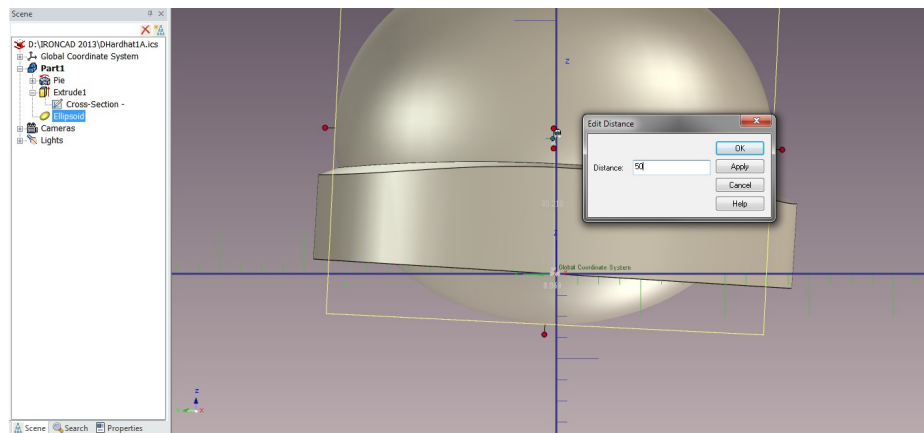

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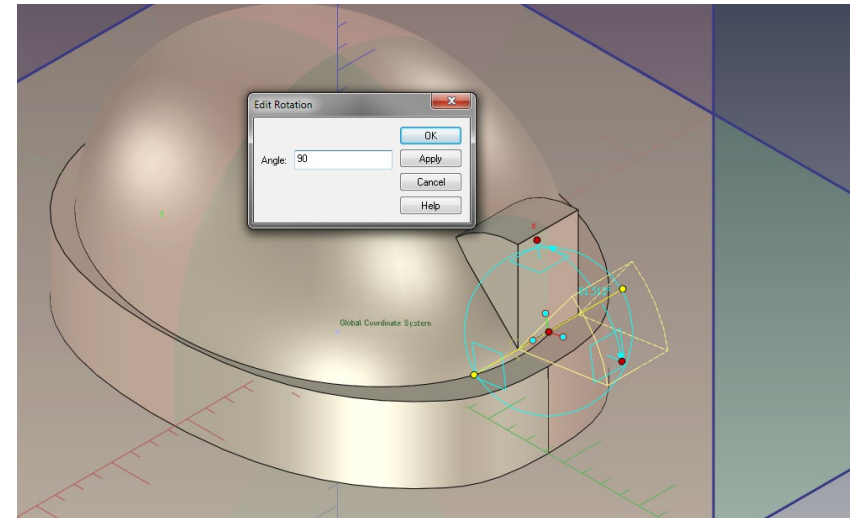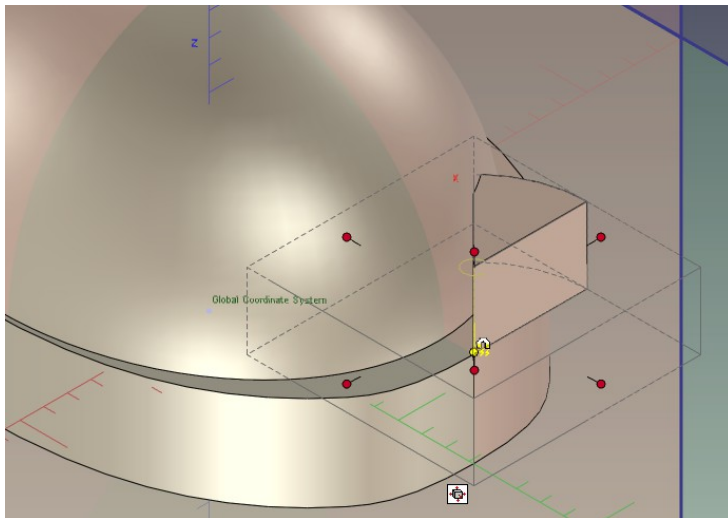
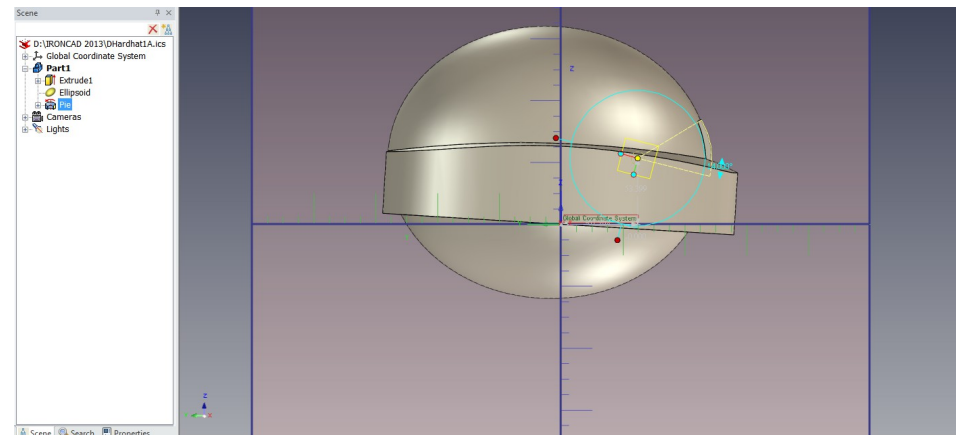Change view to Left from the Camera Picker and position the Pie
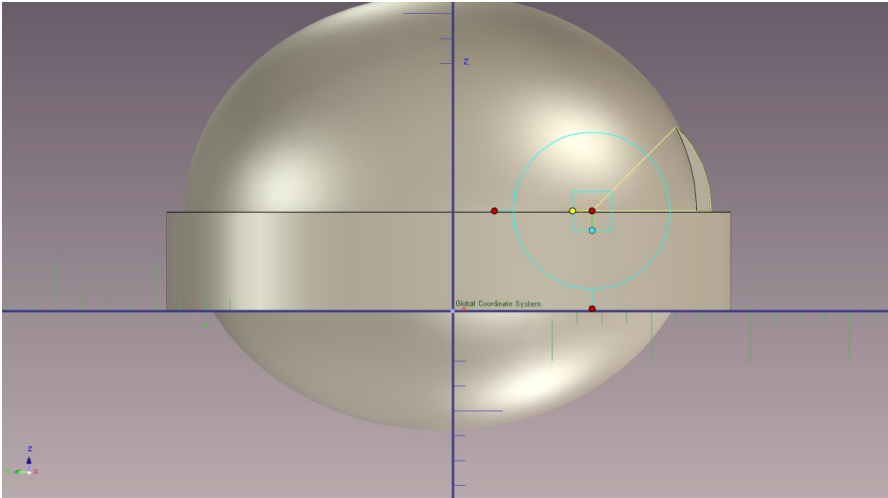
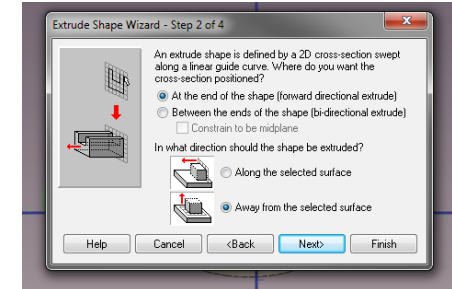Select Part1 from the Scene browser and use the Triball to tilt the front to 3.5 degrees as shown
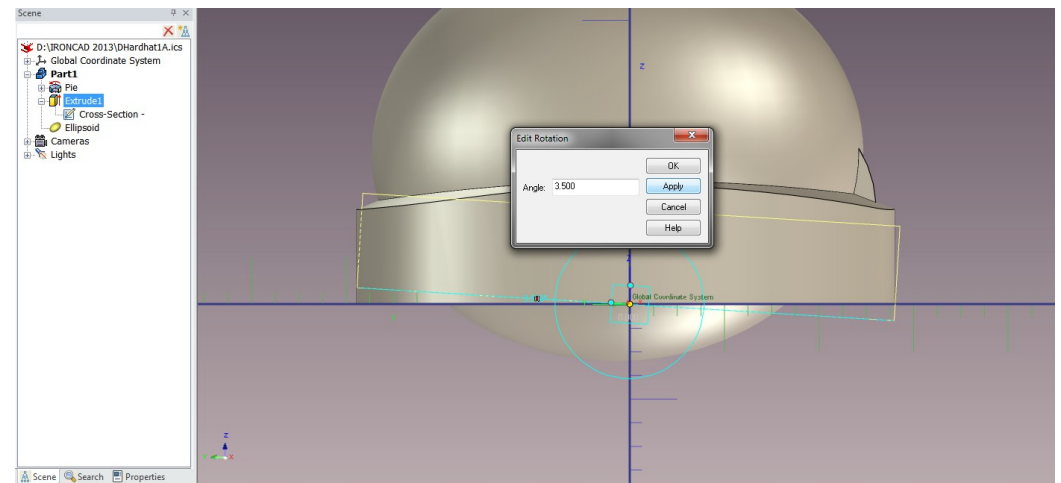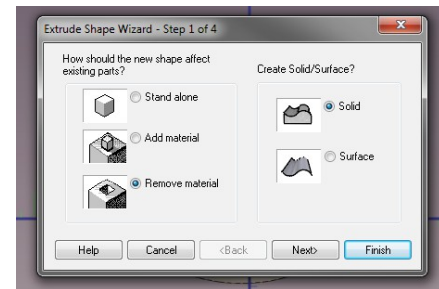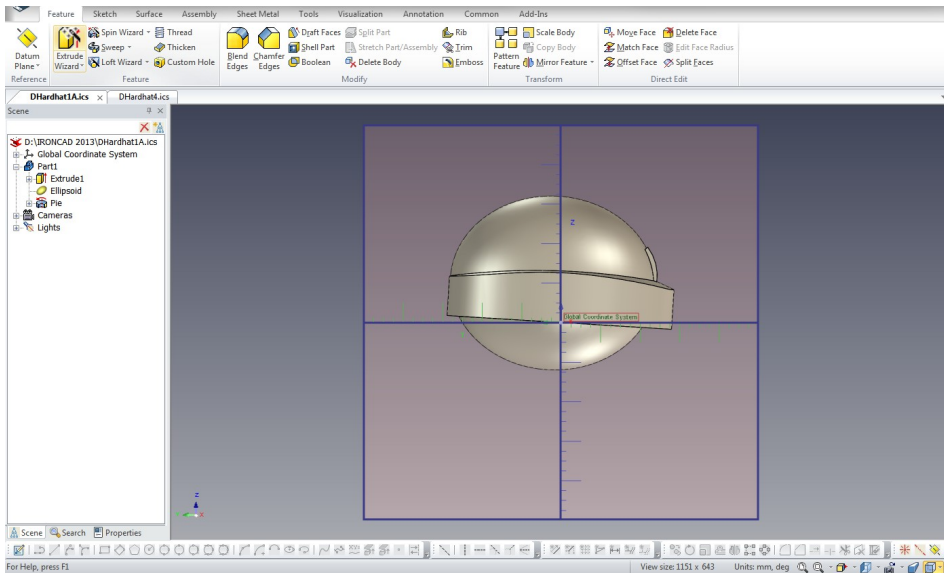

Select the left horizontal handle of the TriBall to pull the Ellipsoid to the left to the edge of Part1
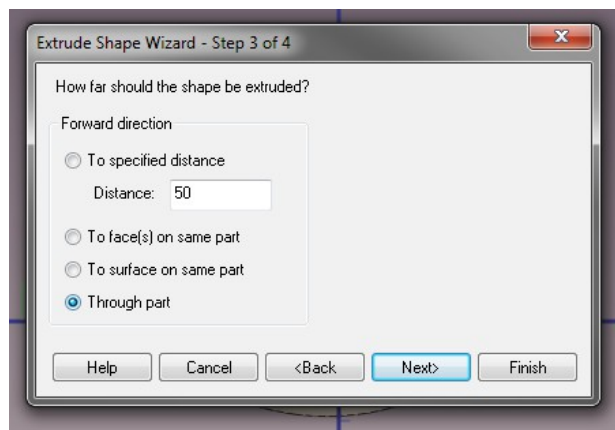

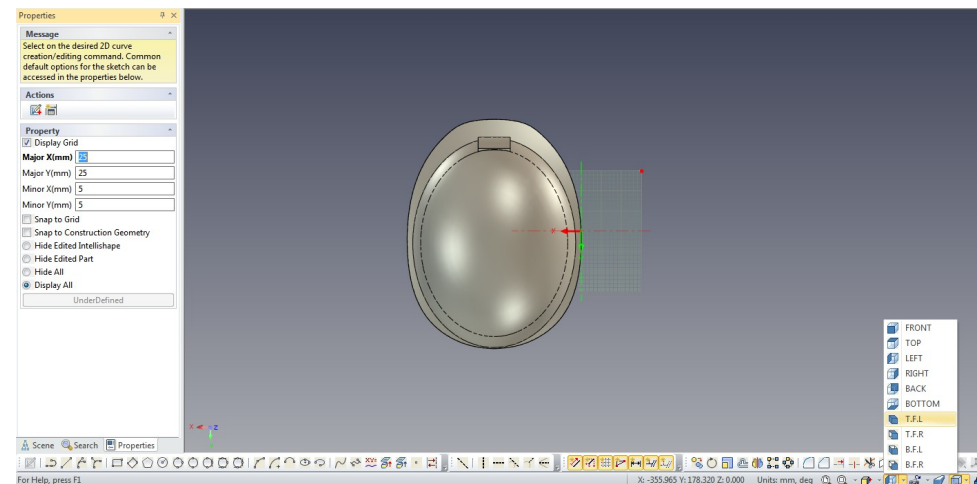Likewise, select the Pie and use the TriBall to reposition as shown

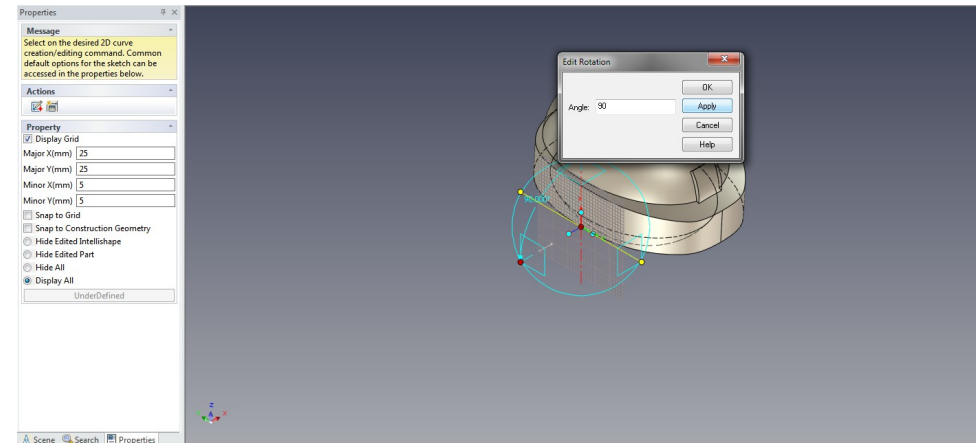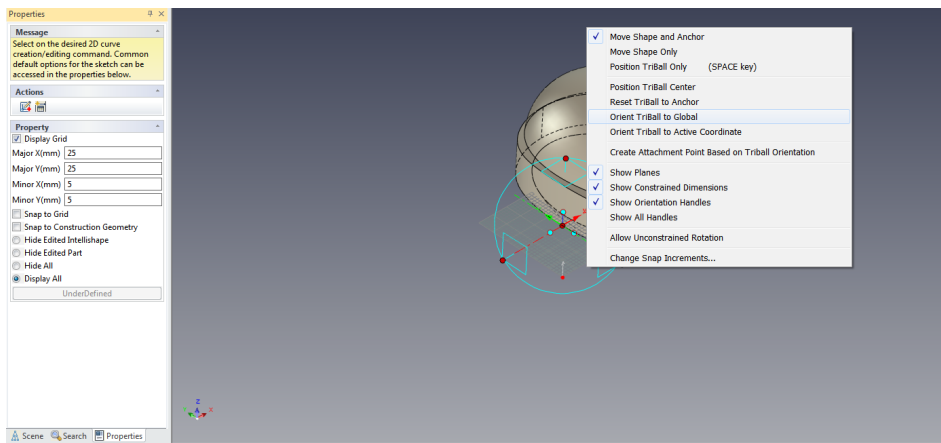Next, select Extrude Wizard to trim Part 1 and follow the steps
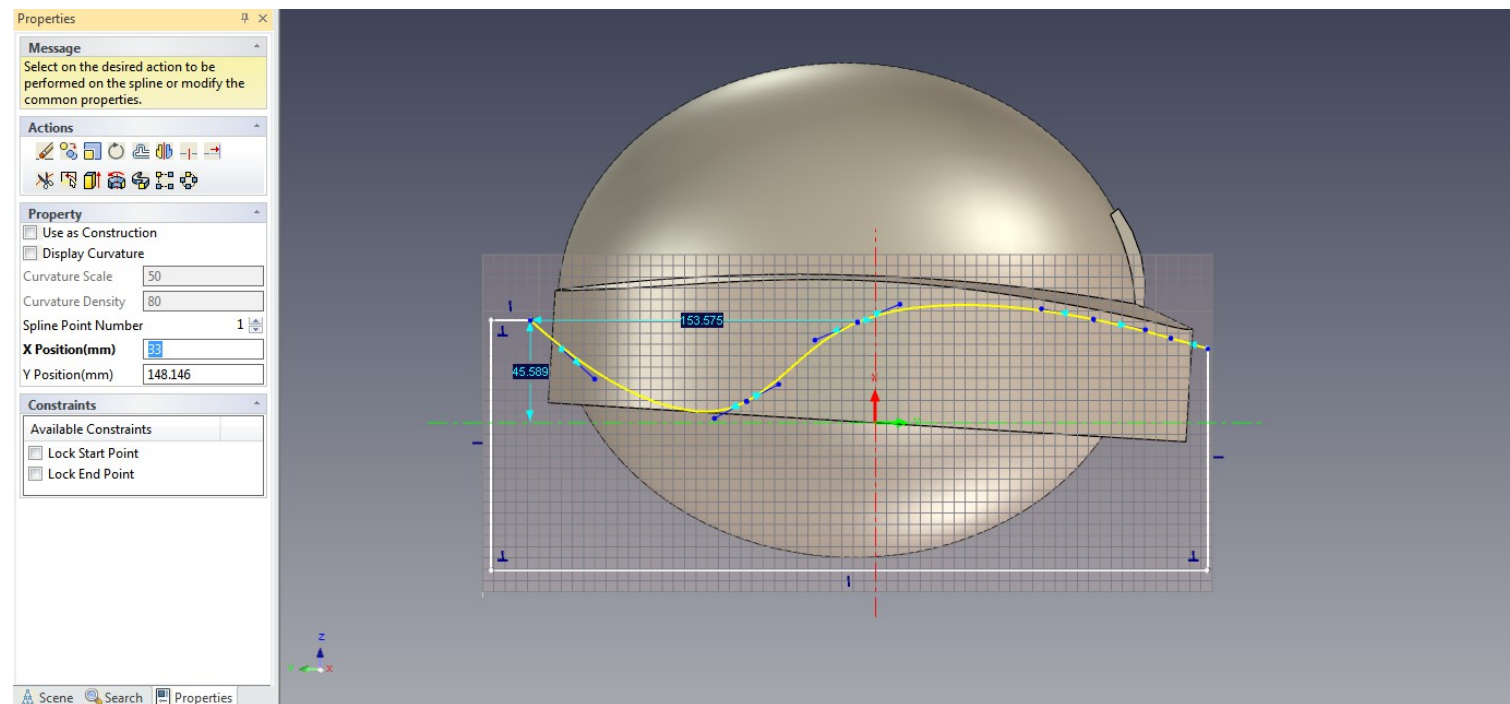

Select Through part and click Finish

Select TFL from the Camera Picker to change view

Use the F10 key and Orient TriBall to Global and orient the Extrude grid as shown
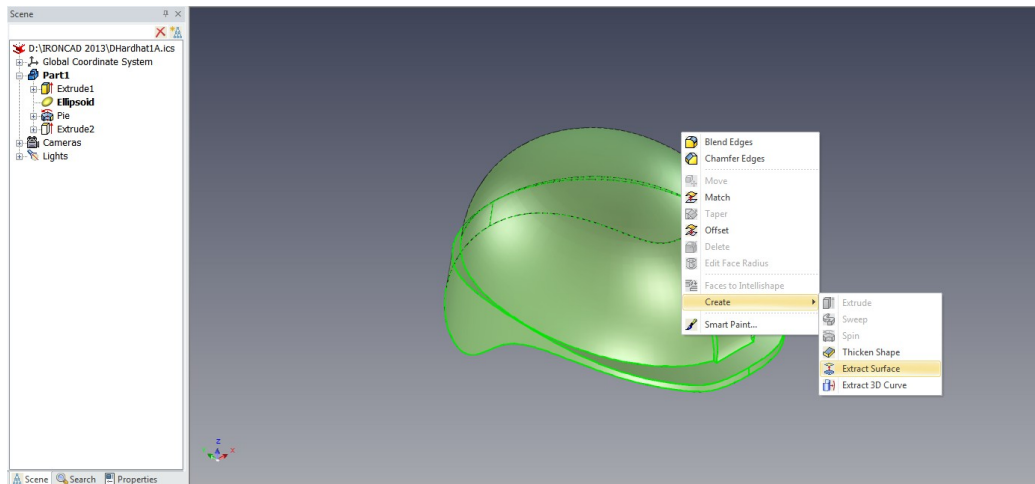

## Sketch the profile as shown and finish when done

If the Extrude remove material did not cover the whole Part1, change to Front view using the Camera Picker and select Extrude2 from the Scene Browser to position the extents with the TriBall.
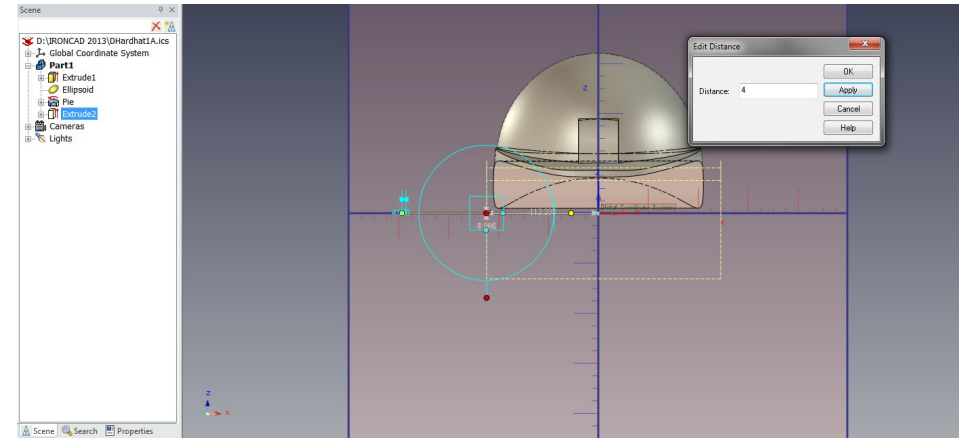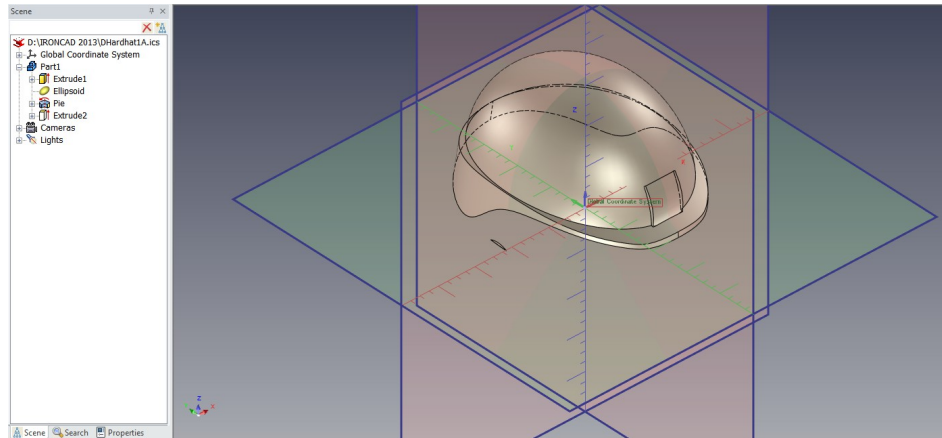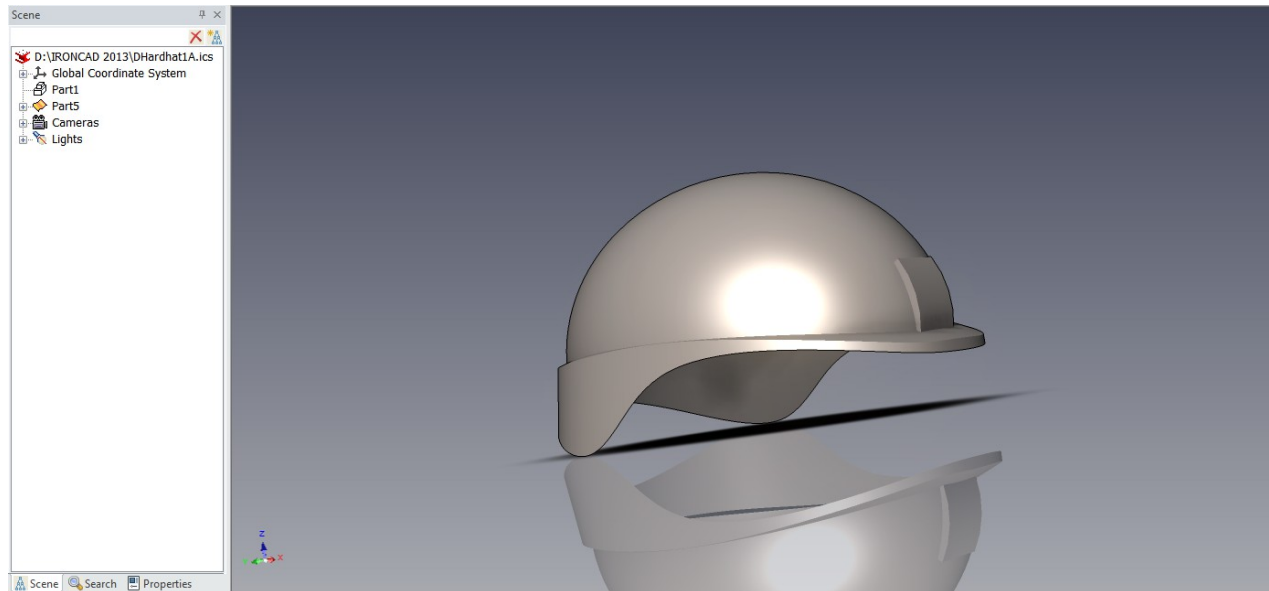

Select the surfaces of the solid model by press and hold the shift key and right click to select Create > Extract Surface
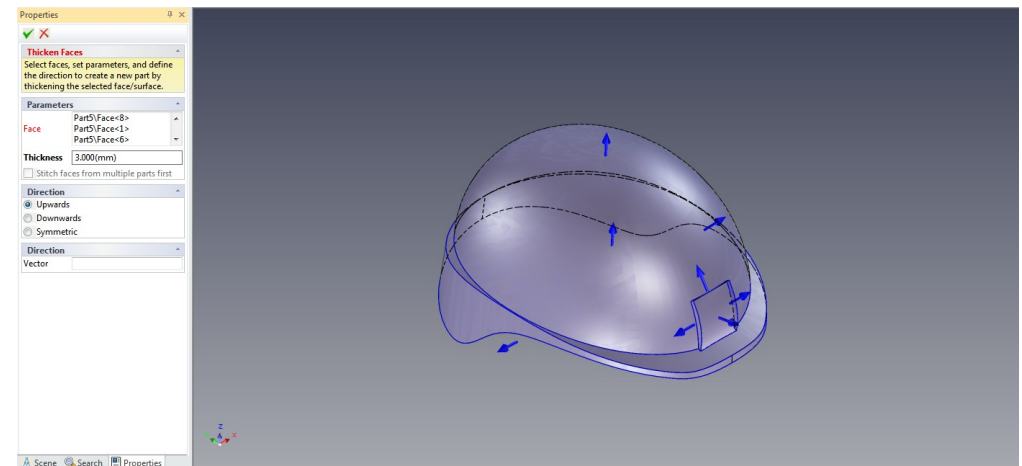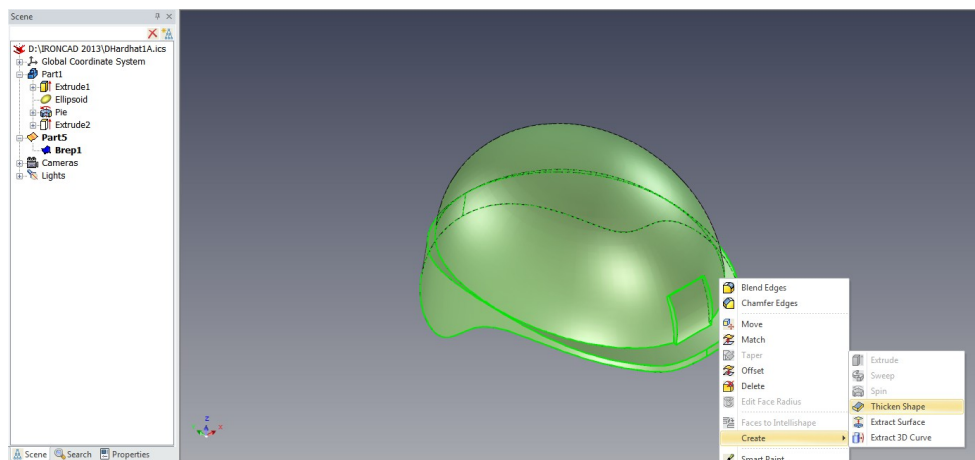

Apply Blends on Part5

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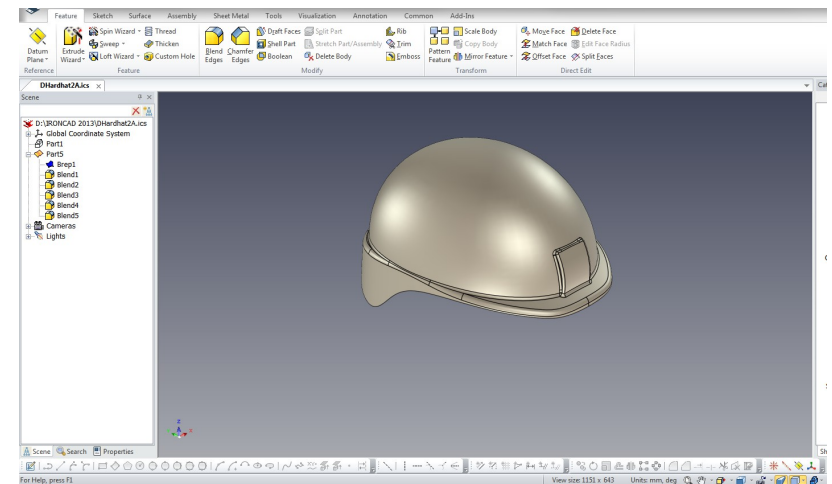
Realistic render with blend

To thicken the Extracted Surface, remove all blends and hold shift key and click surfaces of the Brep. Right click and select Create > Thicken Shape. Enter the required value. Increase the Surface Part Smoothness to work with complex blends.

Refer to Dhardhat2A.ics file

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