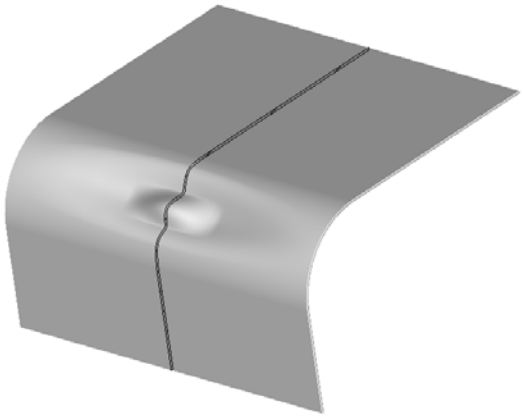
Introduction to ISDX
Interactive Surface Design Extension
Creo 2.0

Level 7 Continued

Create or modify your “config.pro” (or edit and save a config.pro) such that the graphics driver is changed to opengl. IE include the singular line “graphics opengl” , no “ “. Remember, this config.pro needs to be in your “root” directory (IE P:). You need to restart Creo for this to take effect as the config.pro file is read on software startup. This will allow you to use the reflection function in the PLS exercise. Work through the PLS assignment for Lab 4, Level 7. After completing the procedure, screen capture the ISOMETRIC view of the completed PTC cover (figure 17 in the exercise).

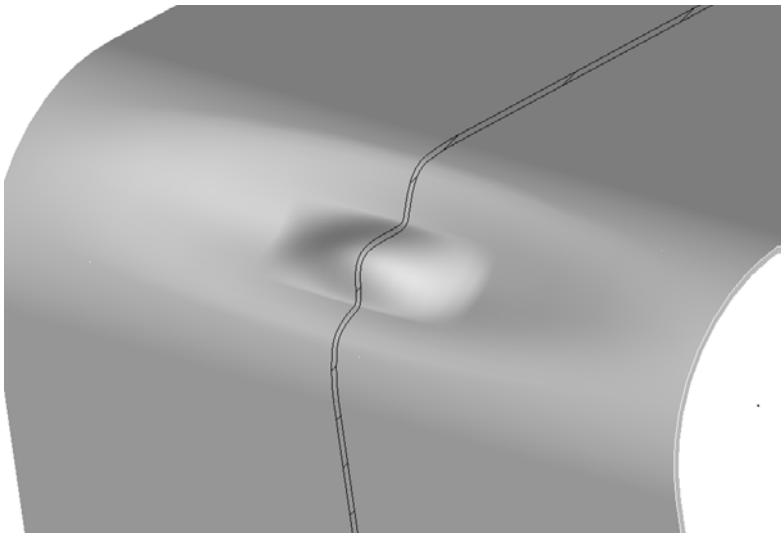
Pay particular attention to Task 2, step 6. The order that you select the curves is critical. If you deviate from this you probably will not be able to effectively create the C2 Continuous rounds in Task 3, step 7.

Note: There appears to be a software “bug”; when asked to select the Curvature function from the Analysis area of the Style tab, (Task 4, step 9) no dialog box appears. Instead, select Curvature in the Inspect Geometry region under the Analysis Tab.

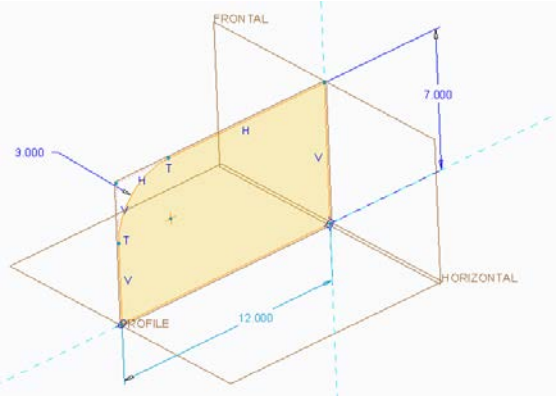


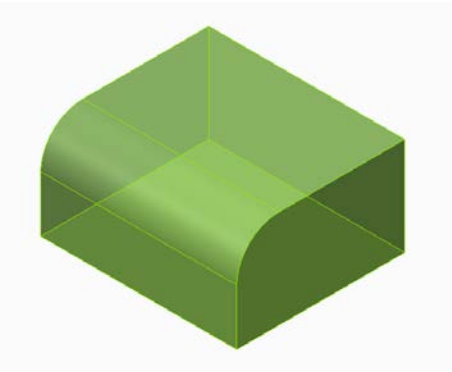
The goal of this portion of the exercise is to be able to model the plastic cover shown above. The cover will actually be hinged on the upper back edge and the rounded area in the front is to satisfy the industrial designers’ requirements. The cross section is shown for clarity.

An enlarged view of the front is shown below.

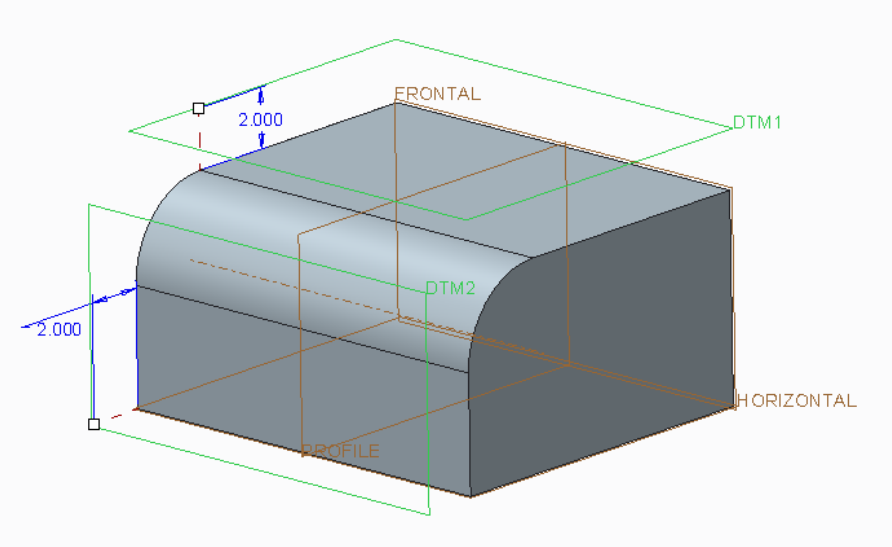


Begin by creating a solid protrusion shown below: The box is 14 wide.

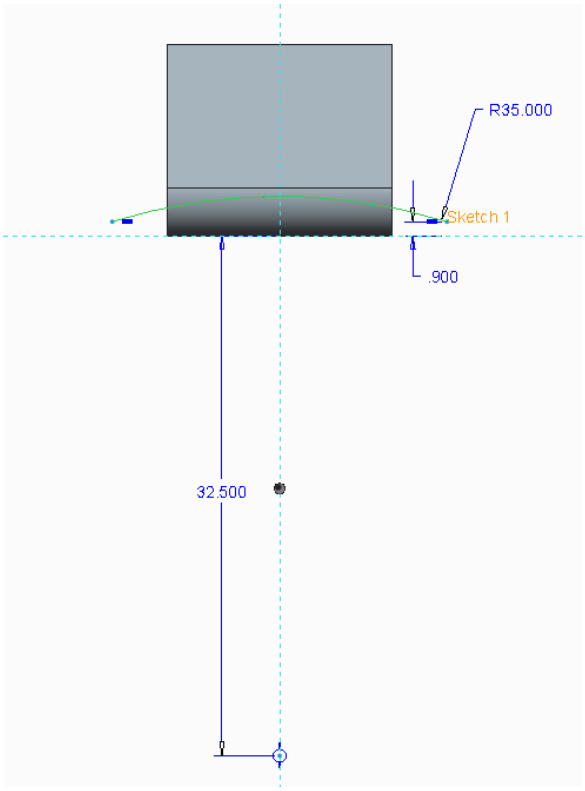




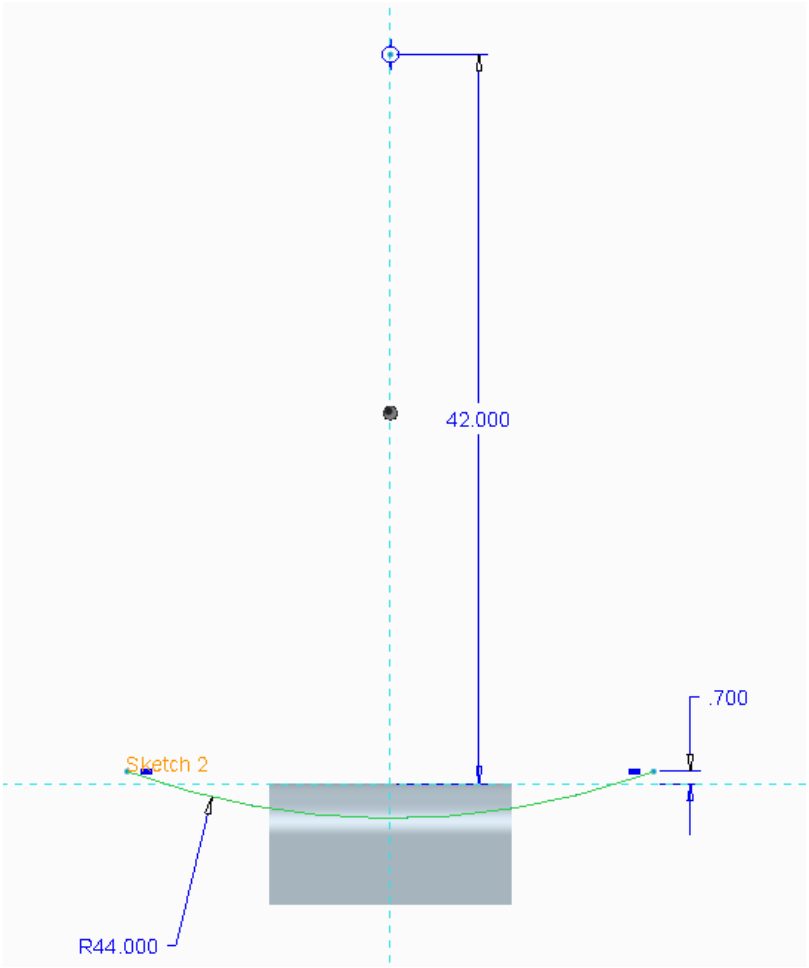
Create DTM1 and DTM2 offset from the front and top surface by 2 units.

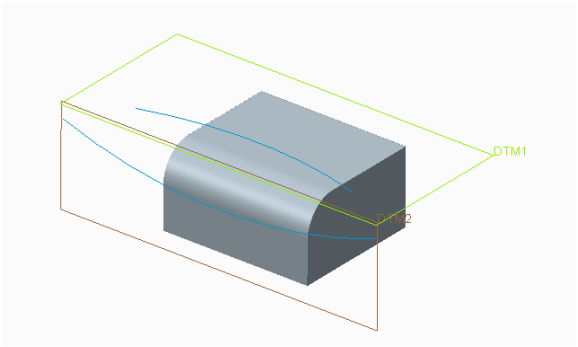


Create a sketched (datum) curve on DTM1 using the following dimensions:



Create a sketched datum curve on DTM2 using the following dimensions:

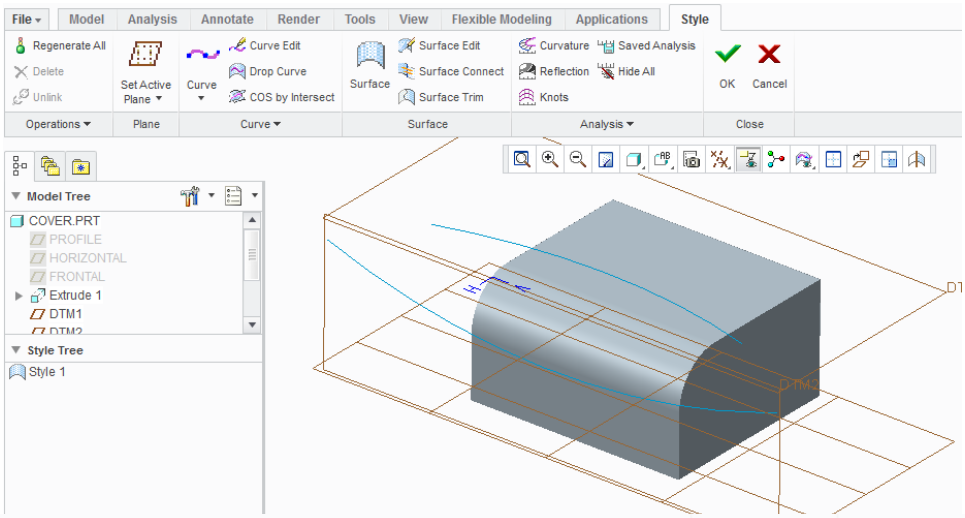




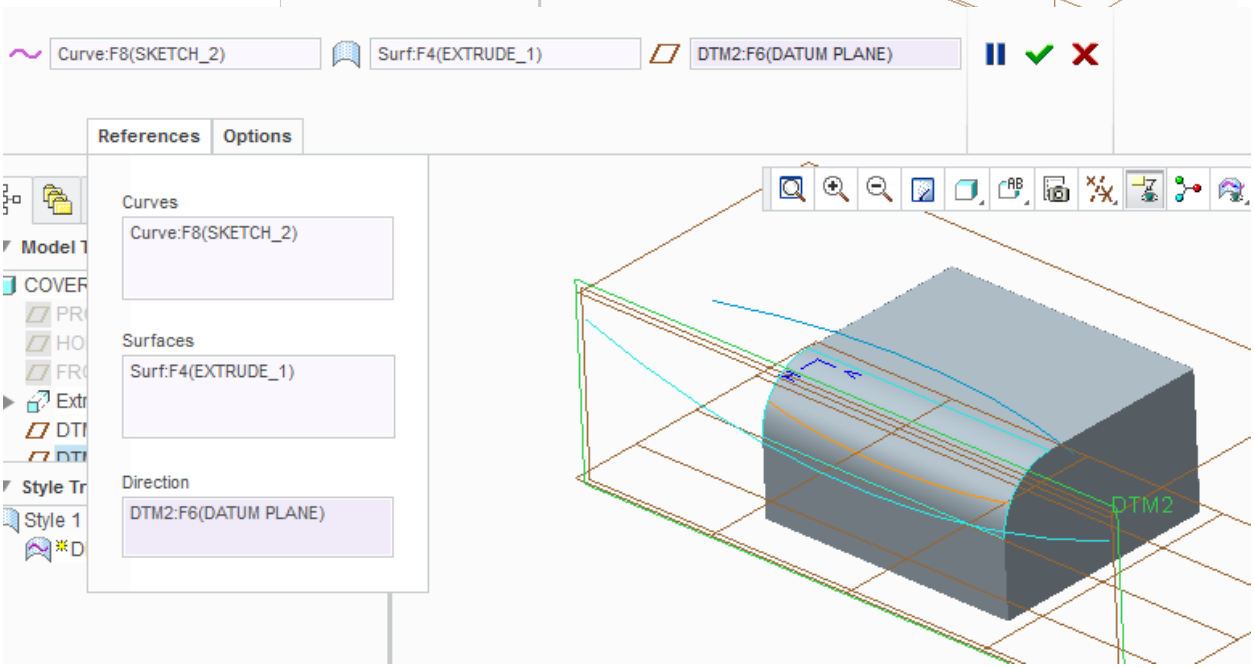
The next step is to generate the style curves.

Start by creating a style feature. This is located on the Model tab, Surfaces region. Notice the following items:

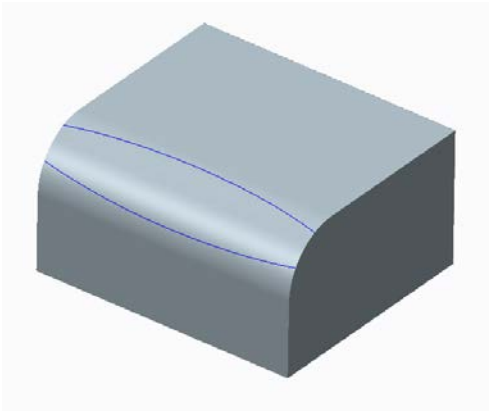
1) There is a “default” active datum plane highlighted (the grid).
2) A “new” options in the now active Style tab. Style features are created using these.



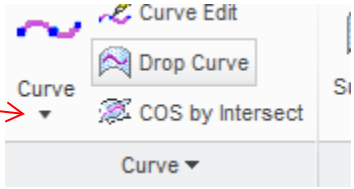
Select the Drop Curve option to project a curve onto a surface. Expand the References Tab and select the appropriate geometry to to drop the curve on the curved surface.



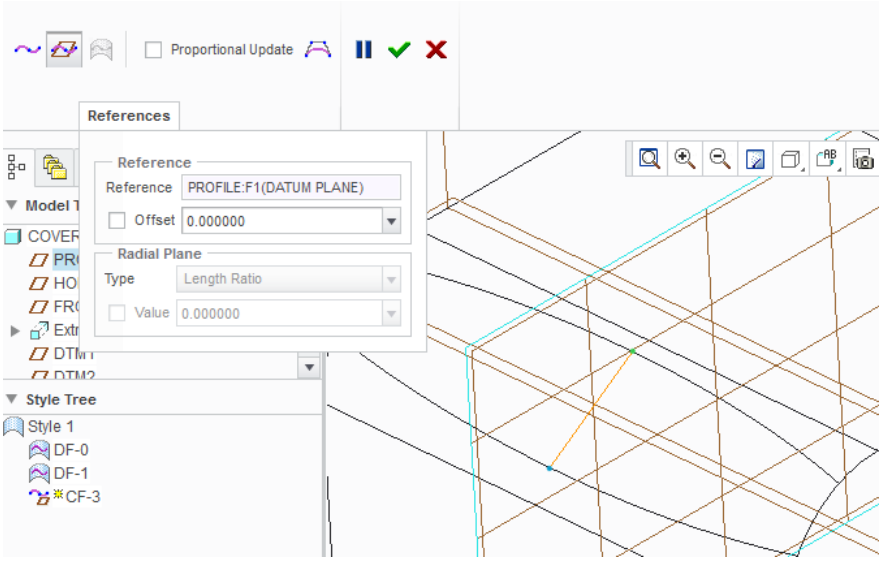
Repeat this for the datum curve on DTM1. Your curves should lie on the radius surface as shown.



The next operation is to do a new curve and then edit it to define tangency. Select the arrow below the “Curve”.



We want to make a “Planer” curve using the Profile plane as a reference.

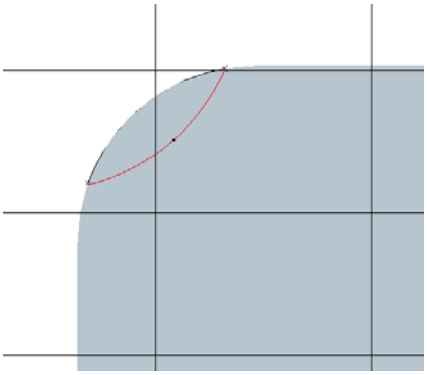


Hold the shift key down (snap function) and select the two curves on surface.

Note the location of the resultant curve; located on the datum, attached to the curves.

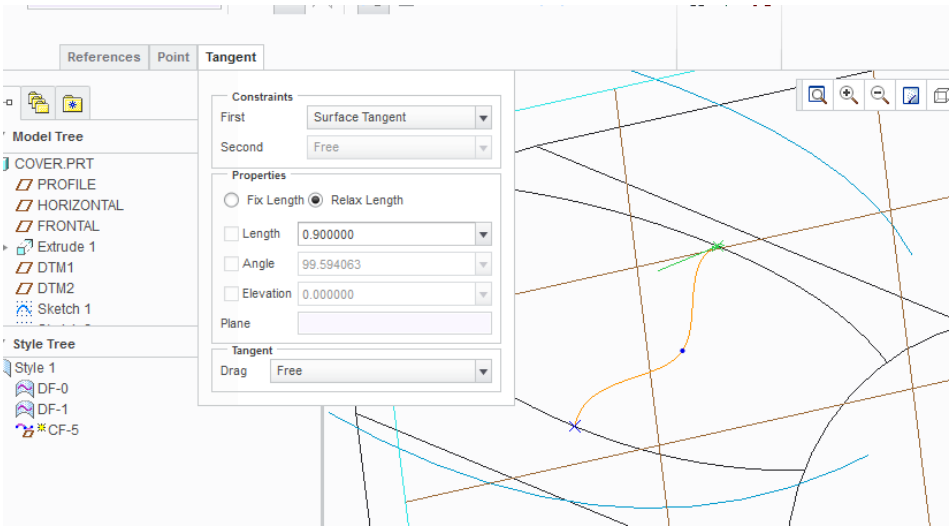
We now need to Cruve Edit.

First add a midpoint to the curve (right click on curve to get Add and Midpoint option)



This curve needs “reverse” curvature as indicated. Turn off the Snap then selecting the point and dragging it. This is best done in the right side view.

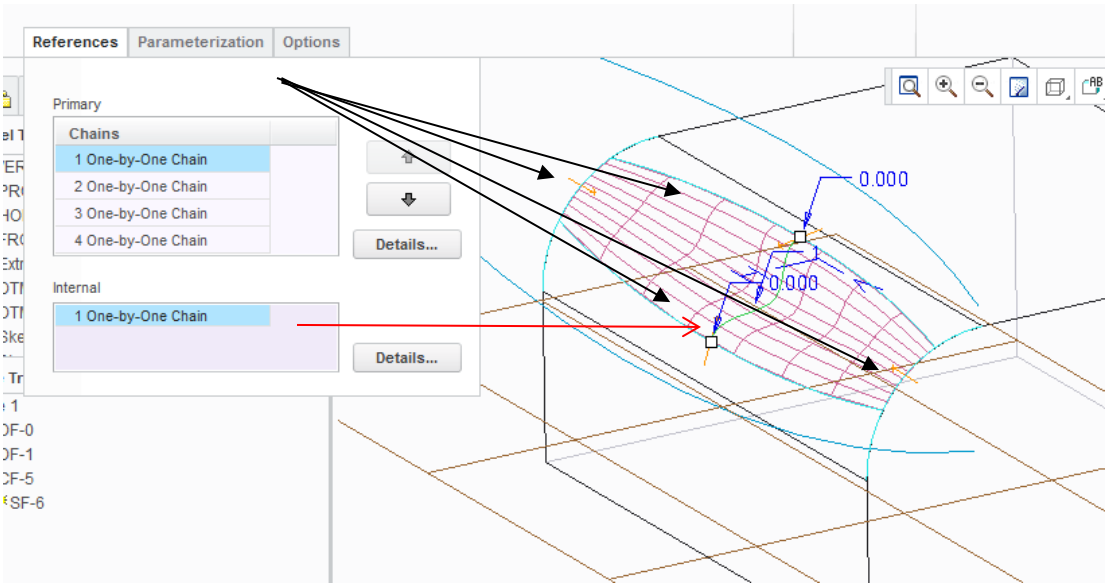
We now need to define tangencies. Select the lower end point. Move the cursor over the green “tangent line” that extends from the end point of the curve, right click the mouse and select Surface Tangent. You can drag the tangent line to influence how this constraint modifies the overall curve. Use the Length option in the Properties area of the Tangent tab to set the vector length to .9

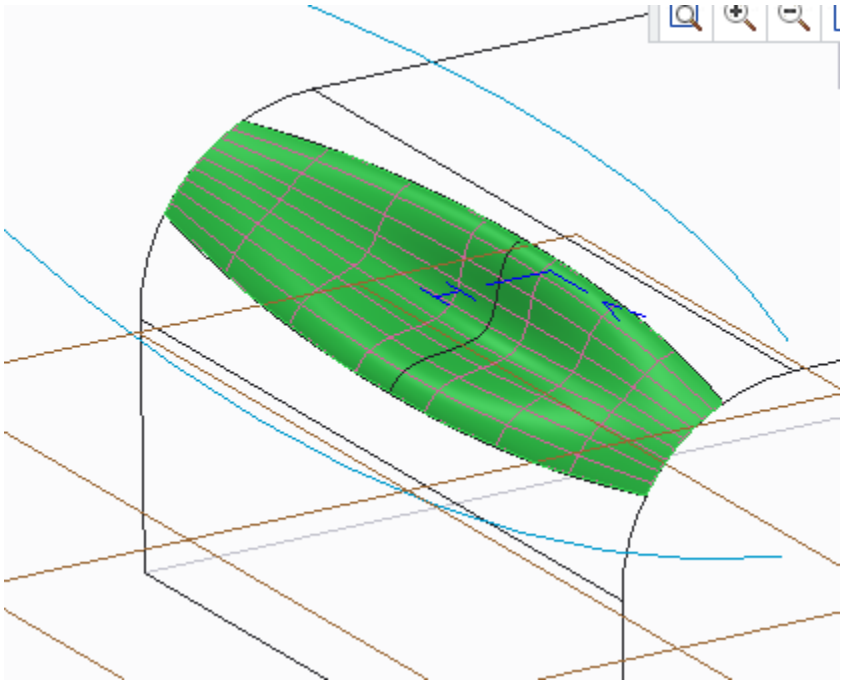


Define the tangency of the other end point in the same way, setting the Length to .9 also.

Switch to **Wireframe** mode. Most surface modeling should be done in a non shaded format anyhow for reasons discussed in class.

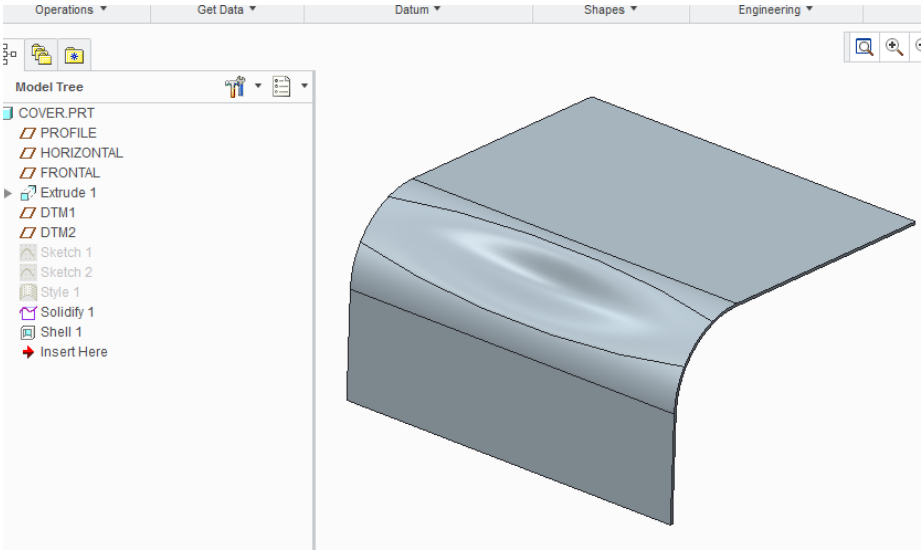
We now need to create a surface.
Select Surface icon to create surfaces from boundary curves (four curves are required). Select this and pick on the curves shown. Select the curve you just edited for the Internal curve. Setting the Connection Icon Scale (Operations area, Preferences) will help visibilities.





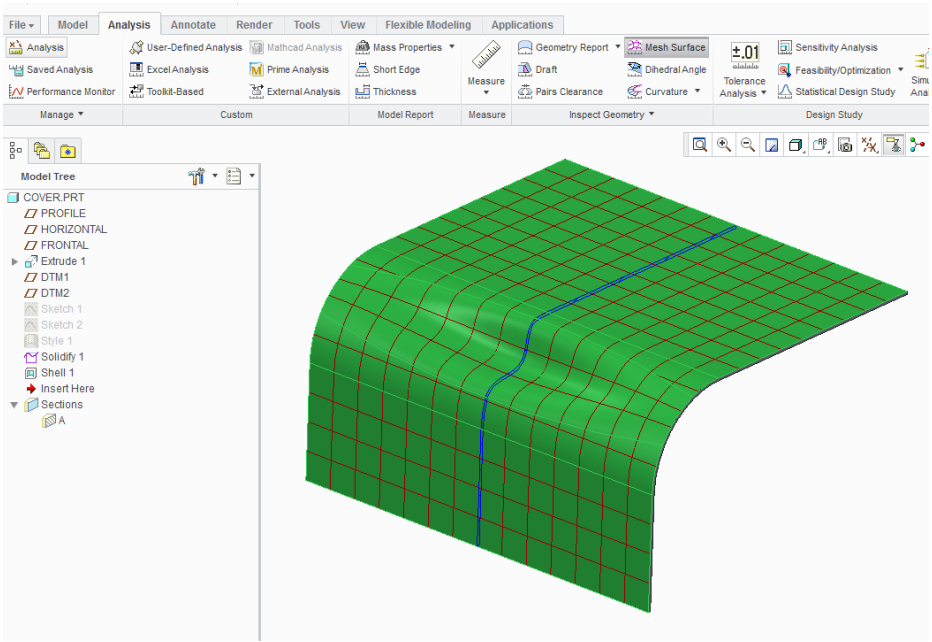
Finish the feature (hit the check mark) and then use this surface (quilt) to make a cut in the solid geometry. Select the Solidify icon in the Editing area on the Model tab to do this. We should use the “Quilt” icon in the Solidify dashboard as all the boundary curves lie on existing surfaces.

Shell this to .100 thickness.



Add a section down the center. Use the View Manager and when creating the cross section select the Preview without Clipping option from the Section Tab.

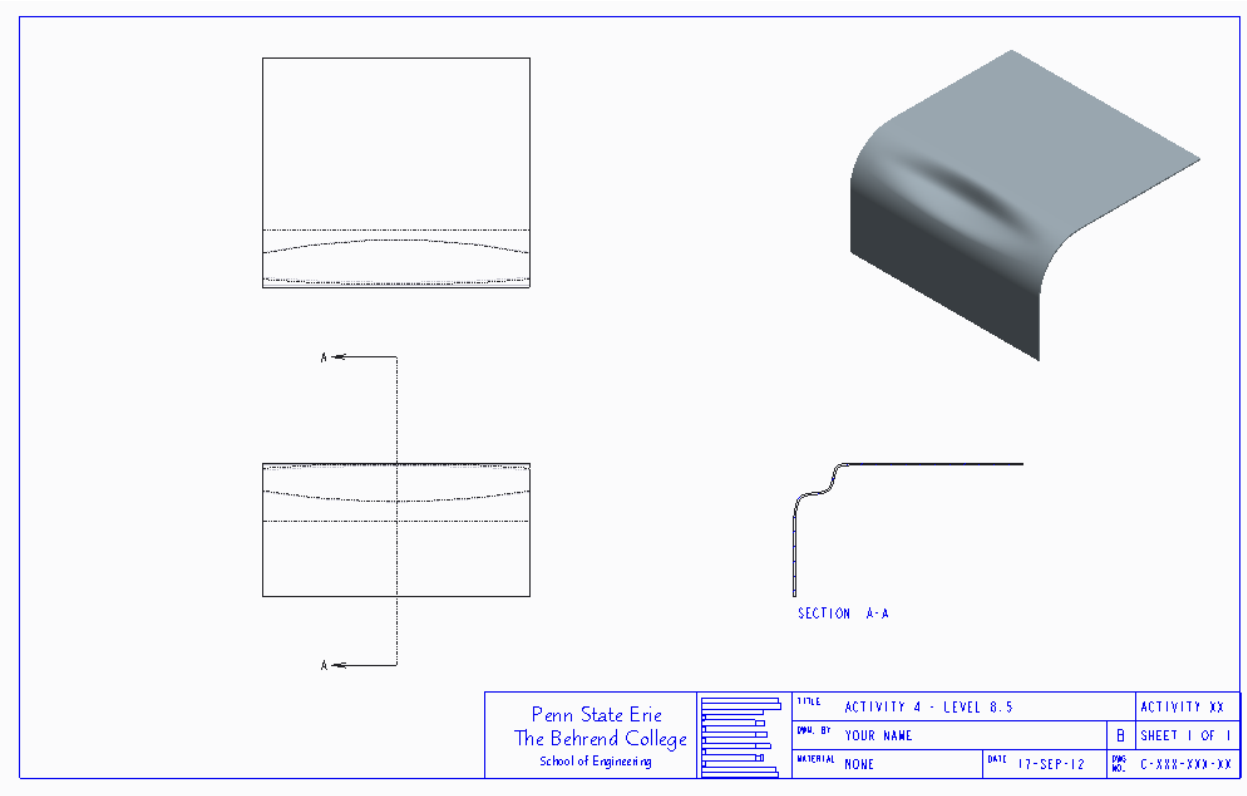
Print out a screen capture showing the geometry as shown. Use Mesh Surface in the Analysis tab to add the surface mesh. Make sure that the cross section is shown. The model tree must be visible. Note that Style feature is hidden. Place this image below the PTC cover you did earlier.



End Level 7.0

Begin Level 8.5:

Create a B size drawing with a scale of .25 for all views. **Print** this on A size paper.
The right view is displayed as an **Area** Cross Section, the isometric view has the Style feature hidden. The Tangent edge display style is set to Phantom.



Answer the following questions:

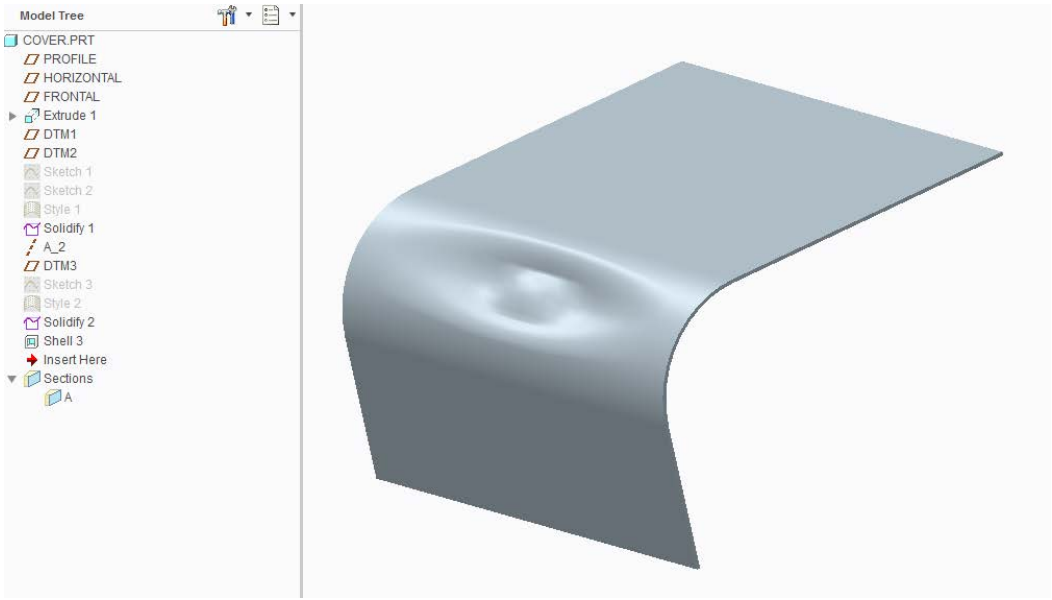
Remember Style is a subset of Surfacing when looking through the Help pages.

1) Define G0, G1 and G2 in term of their continuity levels. Explain what these mean.
2) What is the purpose of the Stop (Regenerate All) light in the Tools area of the Style toolbar? Do the lights ever change color, or is this just a pretty icon?
3) List all the types of tangencies (constraints) that can possibly be applied to an end point of a style curve.

End Level 8.5

Level 10

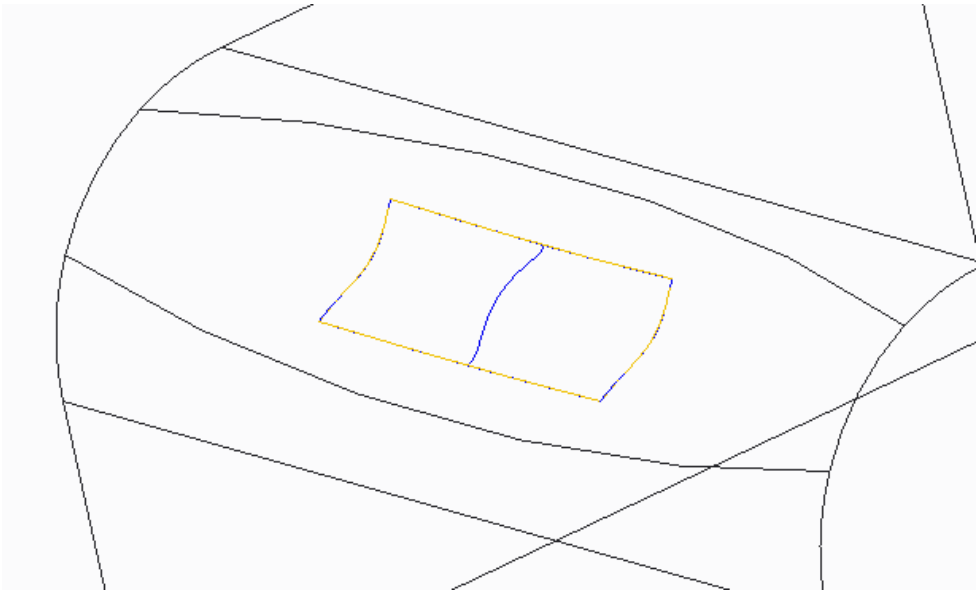
Create the dimpled region similar to that shown below.



Hint 1:
Turn off the section and remove the shell.

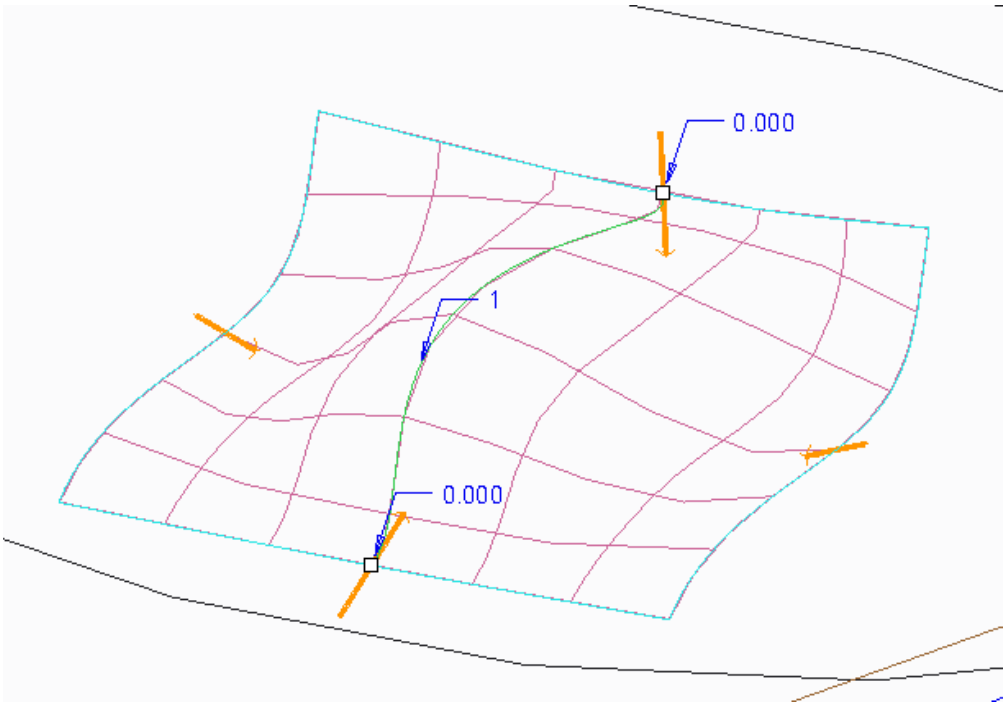
Hint 2:
The region was created by projecting a datum curve in the shape of a rectangle on to the surface and then creating a protrusion. You need to create a datum plane offset from the rounded surface (at 45 degrees).

Hint 3:
Create an internal style curve (projected onto the surface) as shown below.



What is critical on this curve is setting the tangencies of the end points of the curve as before. Start by making both end points Surface Tangent with a length of .2

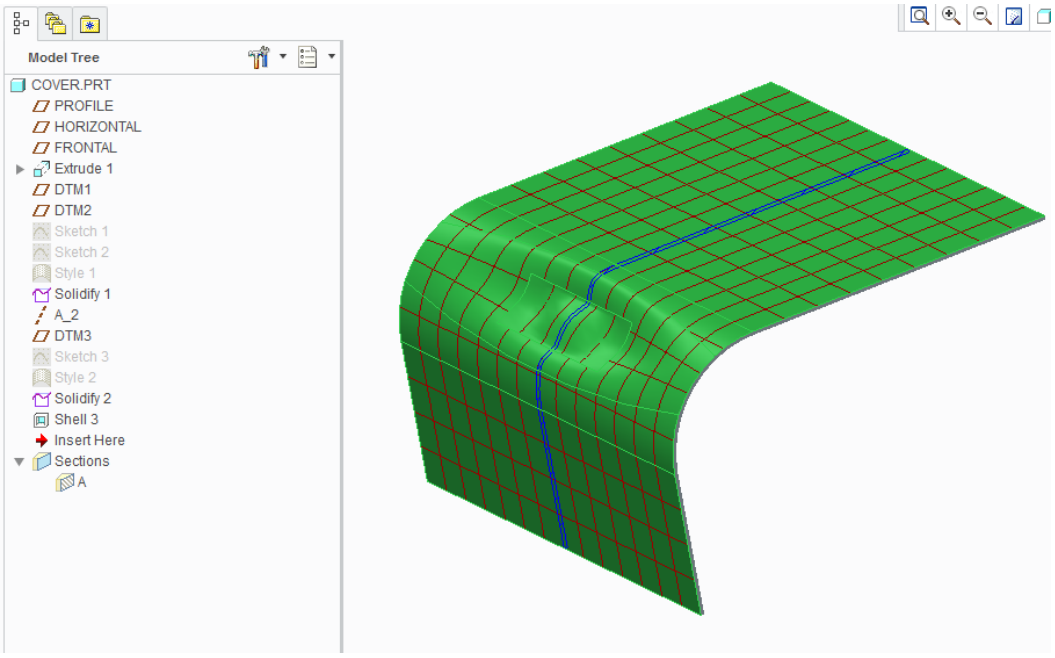
Change this to G2 continuity by (re)setting the end point tangencies to Surface Curvature. Make (doubly) sure you connections appear as shown at the top of the following page.



Solidify this (Replace Portion of surface with Quilt).

Pro/E will replace the surfaces and fill the region with solid geometry, providing the curves lie on the surface.

Generate another meshed & cross sectioned image (with model tree displayed). **Print** this.



Re-print the A size detail drawing which now shows the bubbled up area.

Complete documentation consists of eight pages plus a cover sheet.

Level 7:	Screen capture page, Tangent and Free conditions Detail Drawing, Tangent conditions Detail Drawing, Free conditions Screen capture page, PTC Cover and your Shelled Cover
Level 8.5	Detail Drawing, Shelled cover Word document – Answered Questions
Level 10	Screen Capture page, Shelled cover with bubble Detail Drawing, Shelled cover with bubble