



# **3DXpert**

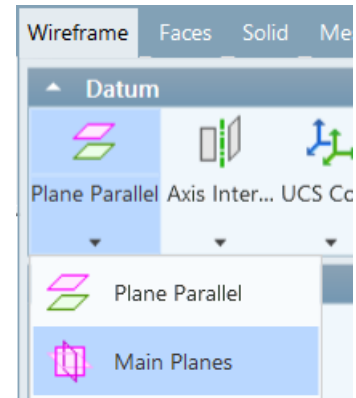
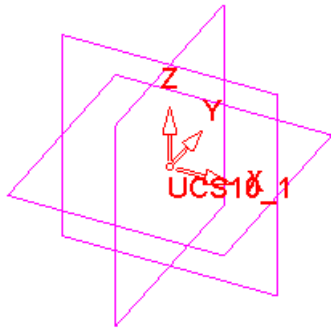
## **CAD Exercise - 4**

### **Solid Operations - Cup**

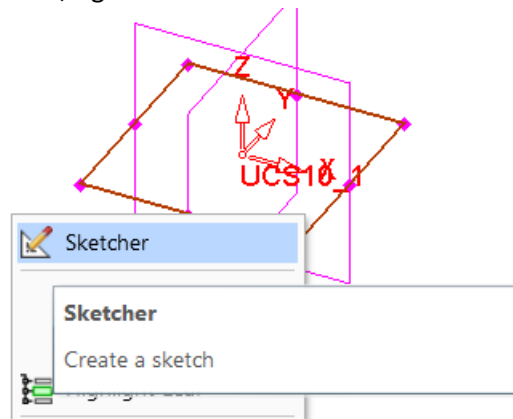
**Tutorial\_V1 - Updated: 13,0300,1476,1113(SP3)**



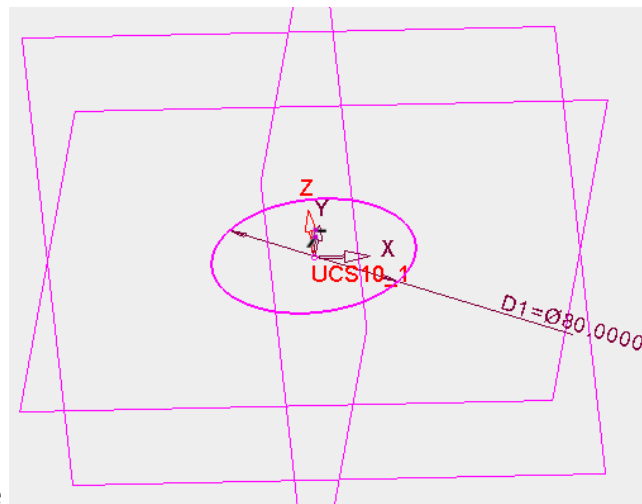
1. Create a new mm Part file
2. Select Wireframe-Datum and switch to the Main Planes. Pick the UCS on screen.



3. Pick the XY plane, right mouse click and select Sketcher



4. Draw a circle with a diameter of 80 mm. Right mouse click and OK to exit the sketcher.

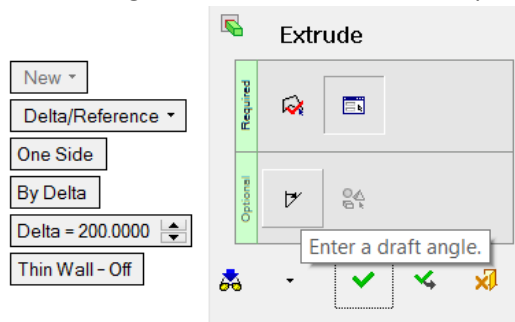


5. Note that the

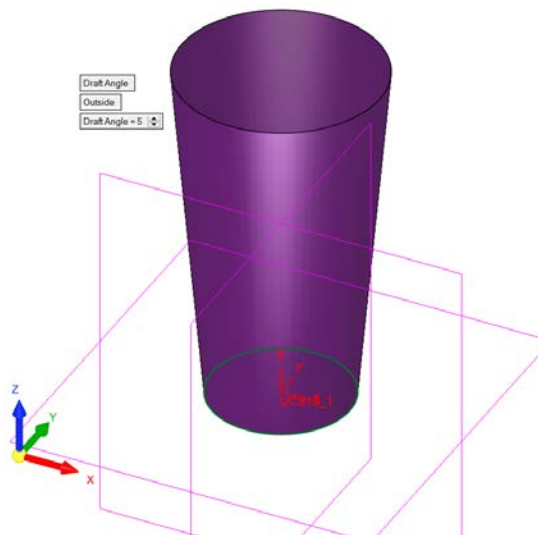
lect Extrude



6. Enter a height of 200mm and click the optional stage for Draft Angle

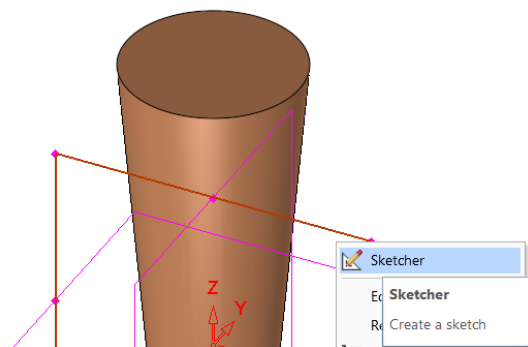


Enter a value of 5 degrees for the angle

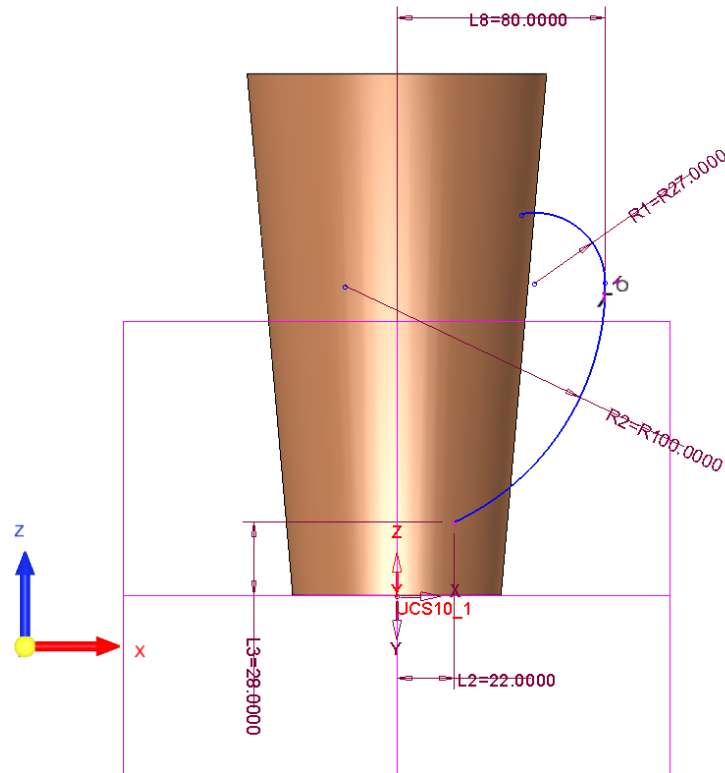


Right mouse click and press OK to approve.

7. Click the XZ plane and enter the sketcher

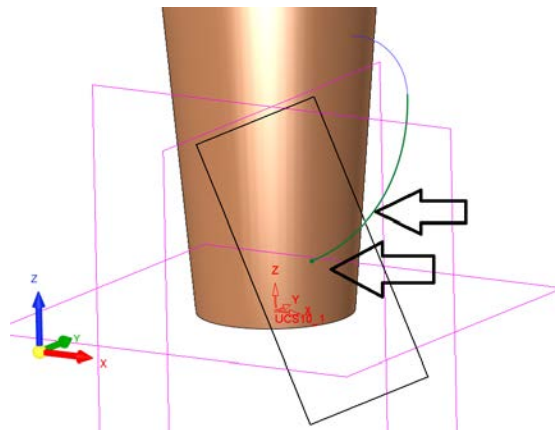


8. Draw the following 2 arcs, add a tangent constraint to them and assign the dimensions: shown here.
9. Note that the upper point of the higher arc is not defined on purpose, so that we will still have some freedom to move it if needed.



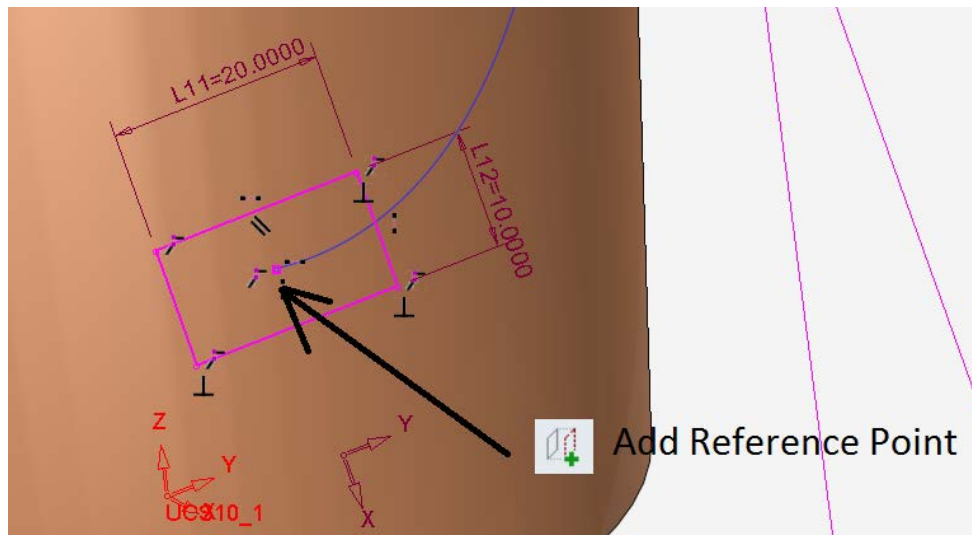
Exit the sketcher.

10. Create a plane which is normal to the lower curve you have created in the previous step. Enter Wireframe-Plane Normal, pick the lower curve and then the point



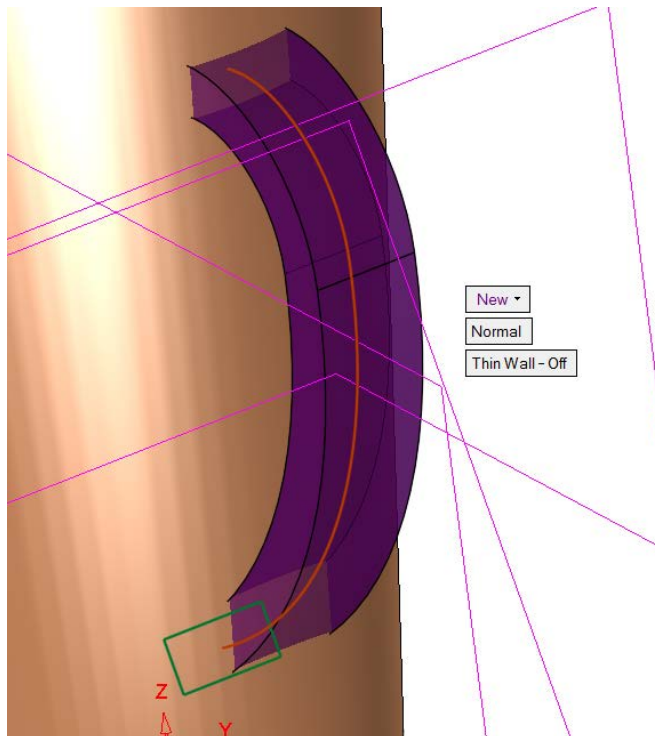
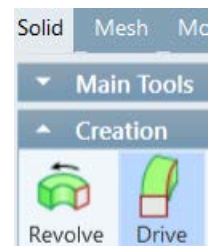
The plane is normal to the curve at the picked point. Right mouse click and press OK.

11. The plane is automatically picked. On this plane draw a sketch as shown here:
- Add a reference point from the curve
  - Create a rectangle by Dimension Height=20, Width=10 and place it on the point

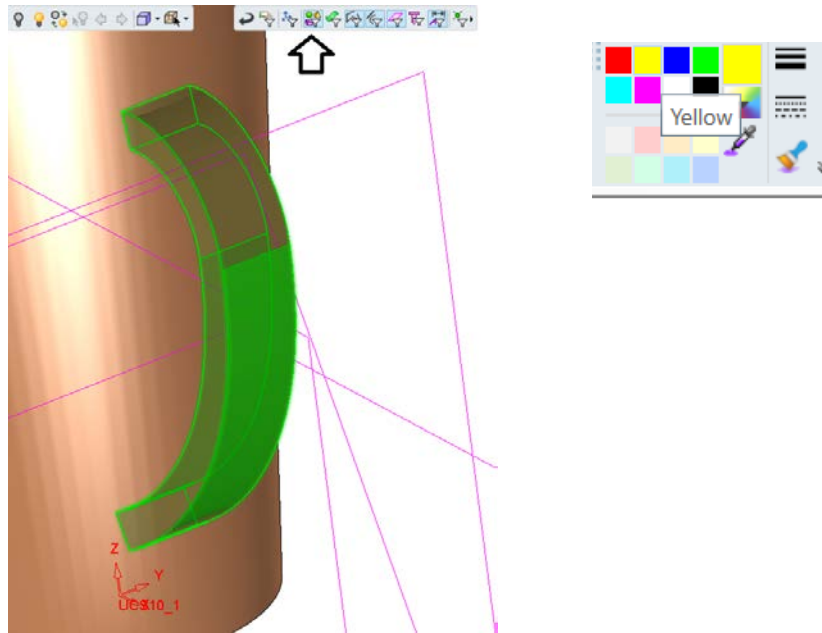


Exit the sketcher.

12. The rectangle is automatically picked. From the menu select Solid-Drive Switch to New. As the sketch to drive is already picked, the system is now ready for the next selection, the drive section. Pick the sketch created in step 9, check that the option is Normal, right mouse click and press OK.

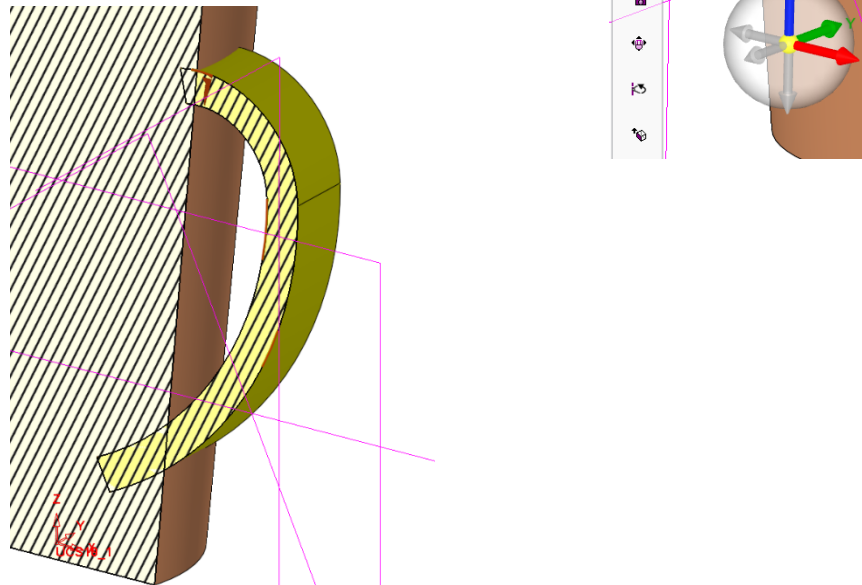


13. The cup's handle is a new object. We can change its color. Set the Objects filter, pick the handle and click the Yellow color from the color palette.

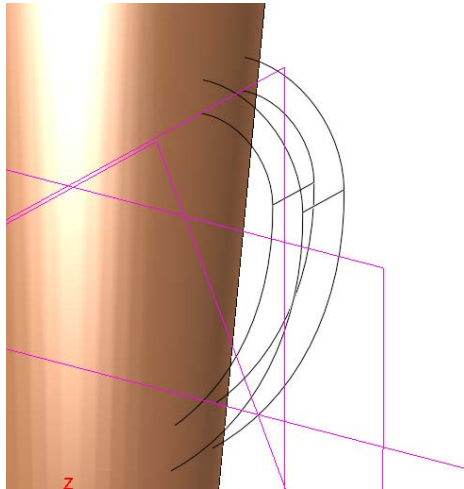


To see that the handle has been created a separate object, hover near the dynamic UCS and from the display bar select Dynamic Section.

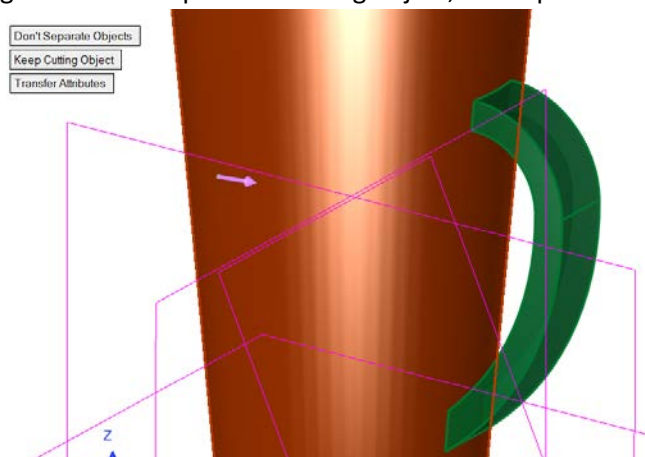
Pick the vertical face of the handle to see that there are two objects.



14. As you can see above the handle object overlaps with the cup object.  
Enter Cut, pick the object to cut – the handle and press the middle mouse  
Button to approve the selection and move to the next step.  
Notice that the handle becomes transparent

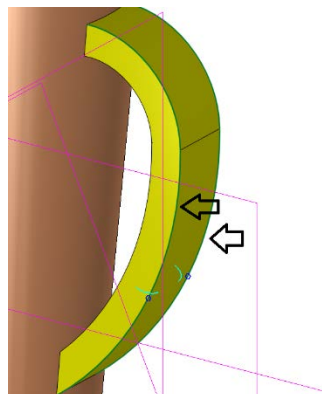
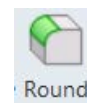


Switch from 'Remove Cutting Object' to 'Keep Cutting Object' - the handle is fully visible  
again - and now pick the cutting object, the cup



Right mouse click and press OK.  
Now the handle does not overlap with the cup's body.

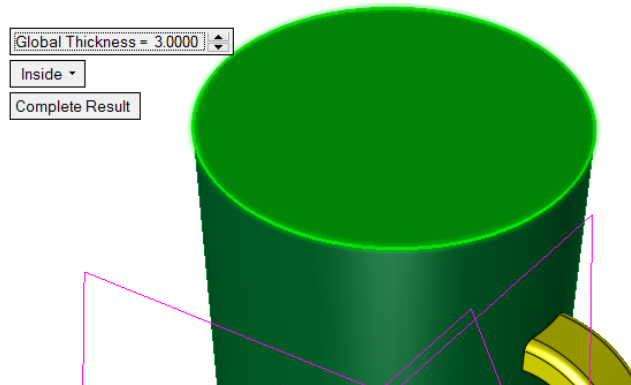
15. The edges of the handle are sharp. Let's add rounds to them.  
Enter Round and pick the two long edges of the handle, press the middle  
mouse button to move to the next step.



Set a round value of 3mm, right mouse click and press OK.

16. The Cup we have created is filled with material. We would like to have only the cup's outer shell.

Enter Solid-Objects-Shell, pick the part, enter a thickness of 3mm and pick the upper face in order to set this as the open face of the cup.



Right mouse click and press Ok.

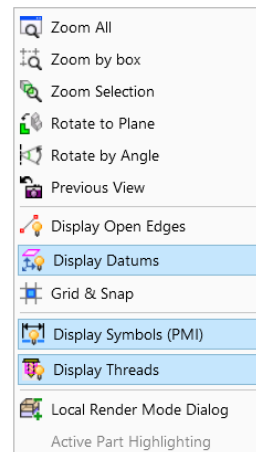
17. We need a shell only on the cup itself, not the handle, therefore we kept them as separate objects. However, now we can merge them to be a single object.

Enter Merge, pick the two objects, right mouse click and press OK.

If you hover over the cup, notice that both the cup and handle are highlighted since now they are the same object.



18. Press both the middle and right mouse buttons to invoke the display sub menu, then turn Display Datums off.



Save the file.  
End of exercise.