



3DXpert

CAD Exercise - 2

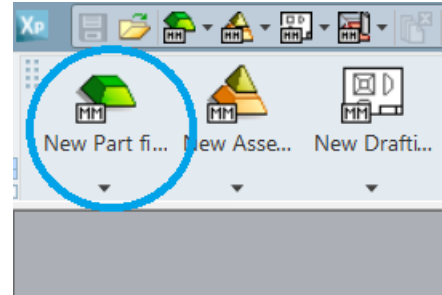
Sketch Constraints


Tutorial_V1 - Updated: 13,0200,1474,1051(SP2)

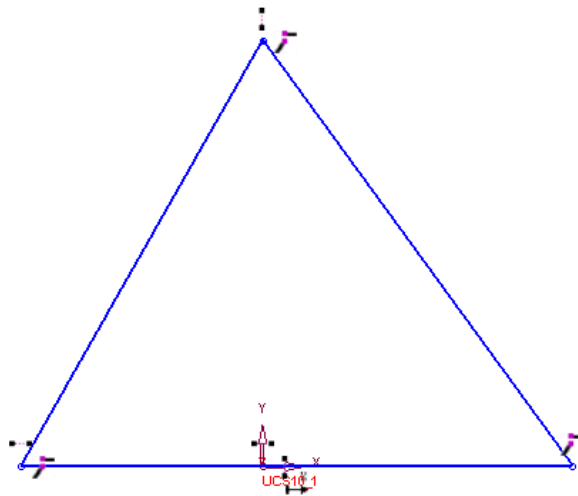
In this exercise, we will discuss 3DXpert CAD environment, specifically - the Sketcher.


We will create a simple sketch and add some constraints.

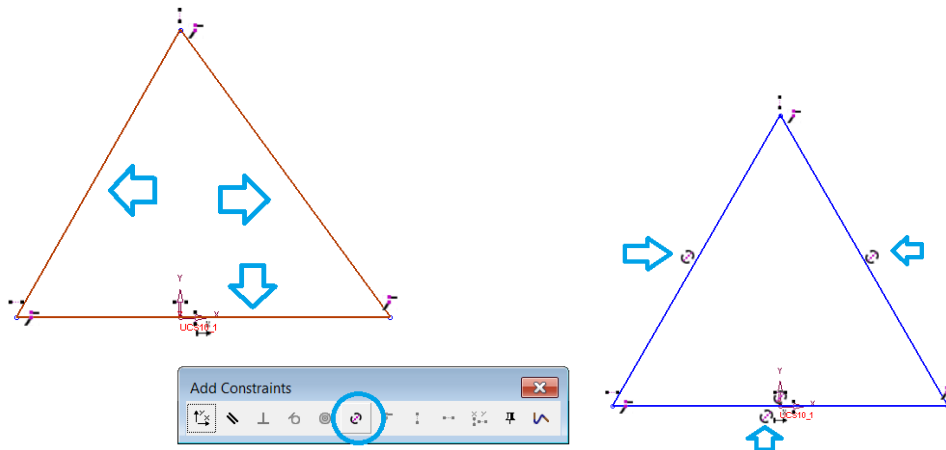
1. Launch 3DXpert and create a new Part file.
2. Enter the Sketcher and press the middle mouse button to approve the XY plane.



3. Create a triangle whose highest vertex is above the UCS, and its horizontal base line goes through the UCS, as shown here. Use the Line option .

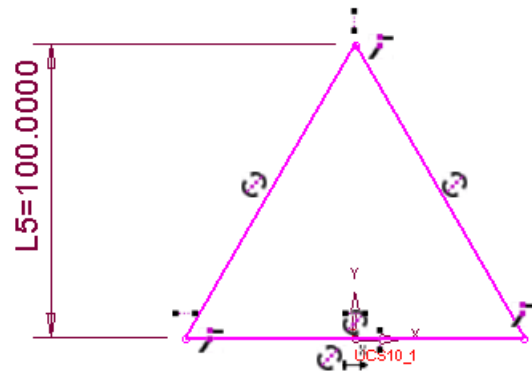


4. Click the Add Constraints button .
Pick the 3 edges of the triangle and set their length by pressing the Same Size button.




Note the 'Same Size' constraint icons added to each edge.

5. Add the dimension to the height triangle

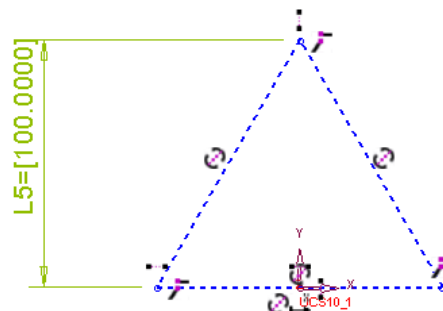


Since this is an equilateral triangle, the height is enough to make the sketch fully defined.

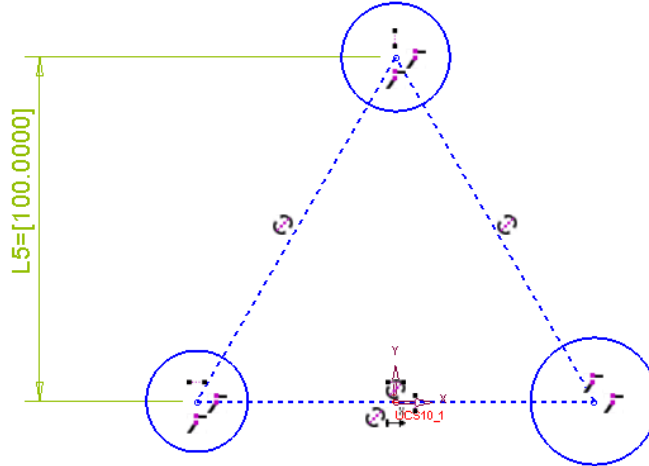
6. We would like to use this triangle as reference. Pick the edges (you can select them by

box) Click the Change Construction Line icon .

The lines will turn to dashed lines.

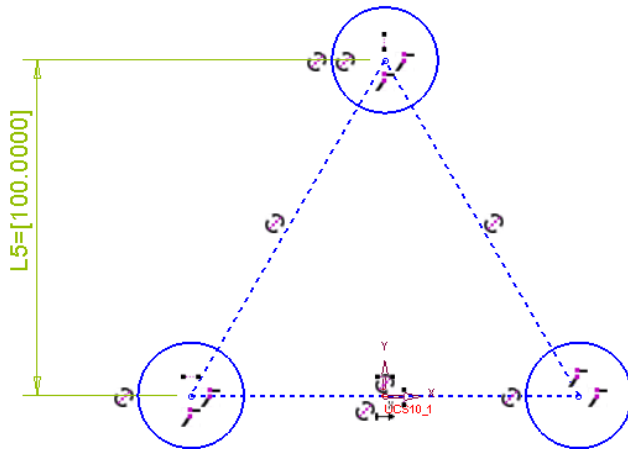


7. On each of the triangle's vertices create a circle, as follows




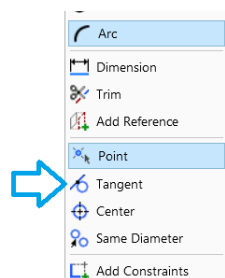
8. Click the Add Constraints button .

Pick the 3 circles and set to all the same diameter. Use the Set Size button as before.
Note: As none of the circles have a dimension, the size of the circles will be dictated according to the first selected circle.

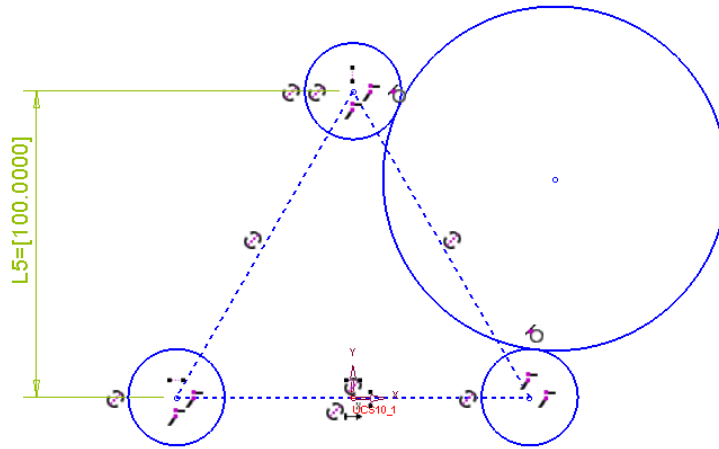


9. Create an arc, which his tangent to both the highest and lower right circles.

To do that, press the Arc icon  and then right mouse click to invoke the sub menu, select Tangent and pick the higher circle, and then do the same for the other circle.

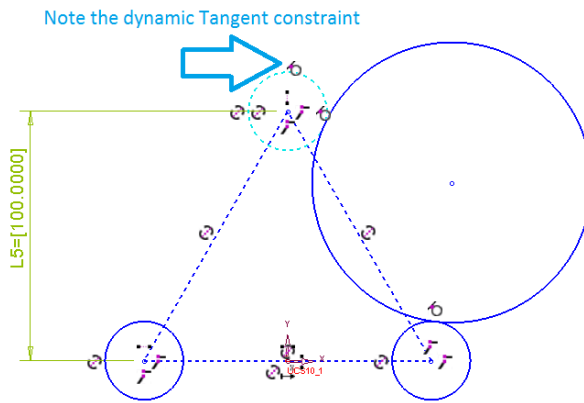


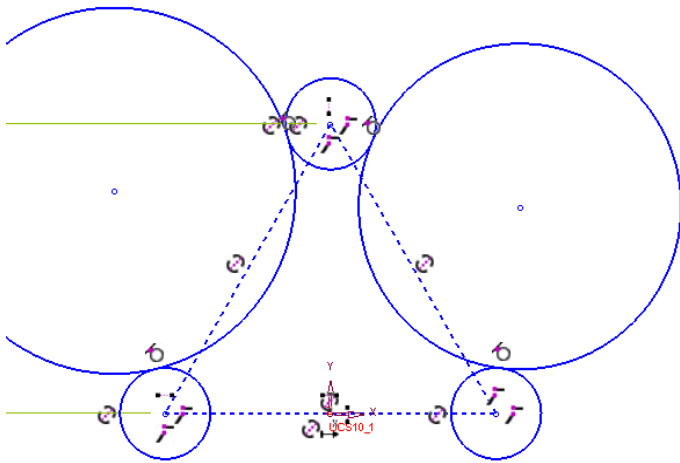
Note: Although we have used the Arc function, the result is a circle, because in the way we picked the references there are actually two possible arcs.



10. Create another circle which is tangent to the higher and lower left circle.

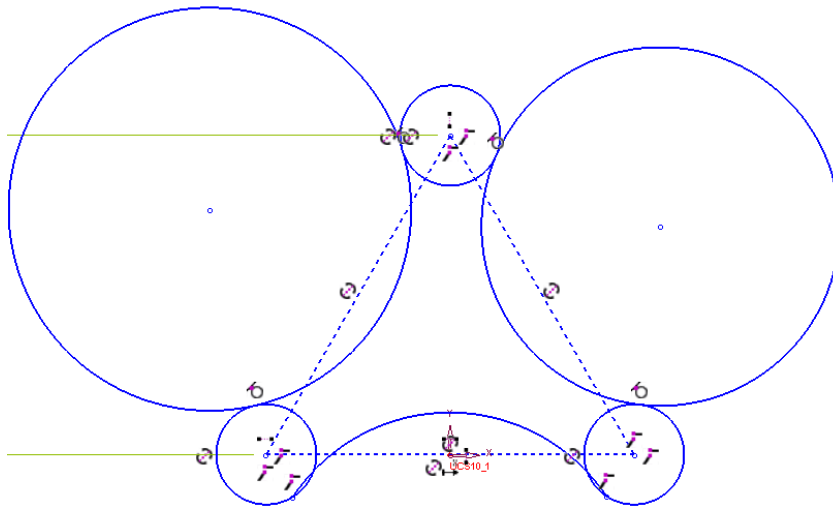
This time, do it using the dynamic constraints. Click the Arc button and hover near to the circles. As they turn dashed cyan, pick them. Click once more to set the position of the circle.





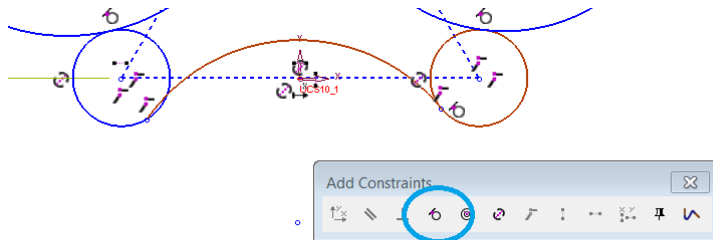
11. Create an additional arc that is referenced to the two lower circles.

This time, click Arc pick the two circles and then pick an additional point for the arc's position:

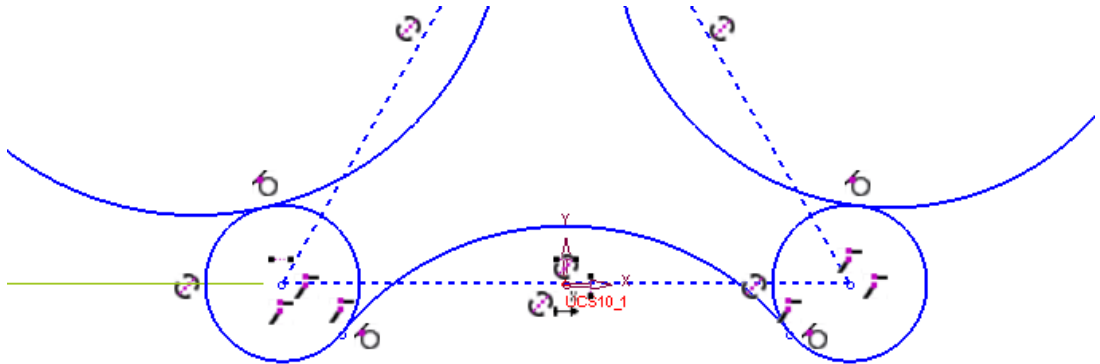


Note that at this point the arc is not tangent to the circles.

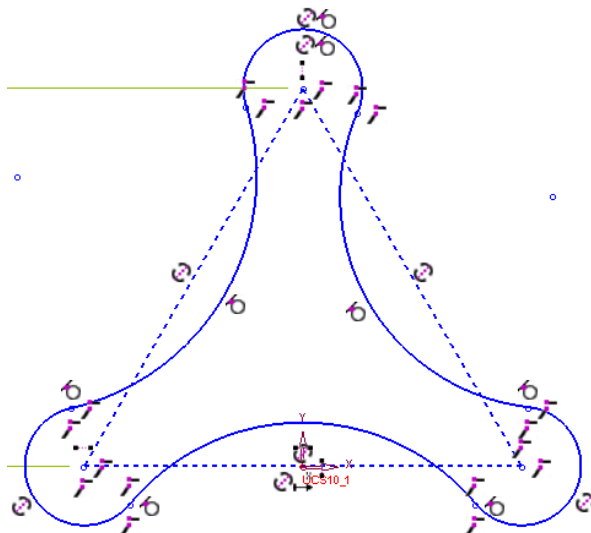
12. Click the Add Constraints button, pick the last created arc and one of the circle.



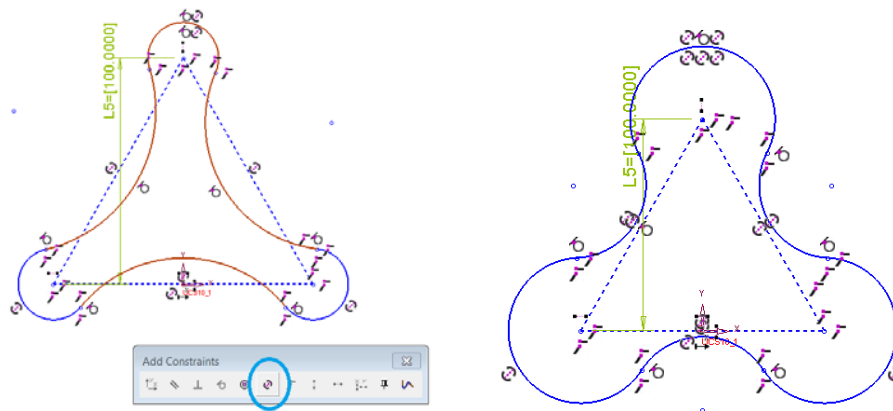
Do the same also for the arc and the other circle. Note the added constraints icons for Tangency.



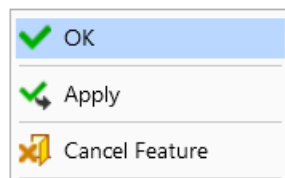
13. Trim the redundant arcs. Press the Trim button and pick the two 'external arcs as well as the remaining inner (smaller) arcs.



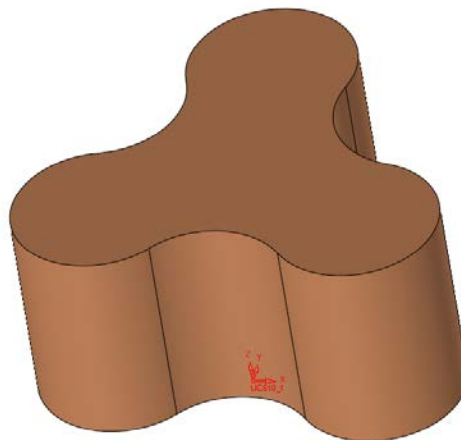
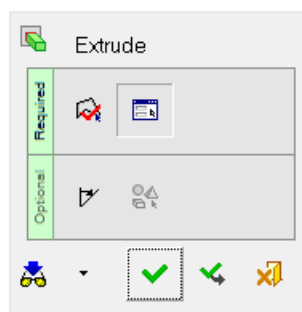
14. Enter Add Constraints Pick the one of the smaller arcs, then the 3 larger arcs and set Same Size.



All 6 arcs have now the same diameter. Set the radius of one of them to 40. Exit the Sketcher: right mouse click and press the OK button.



15. Right mouse click and select Extrude. Keep the defaults and press the OK button.



End of exercise.