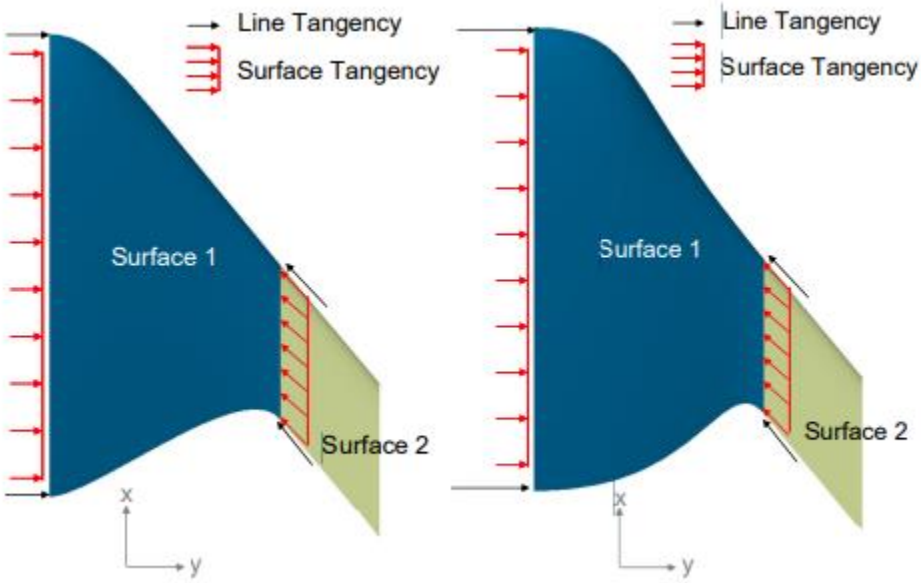
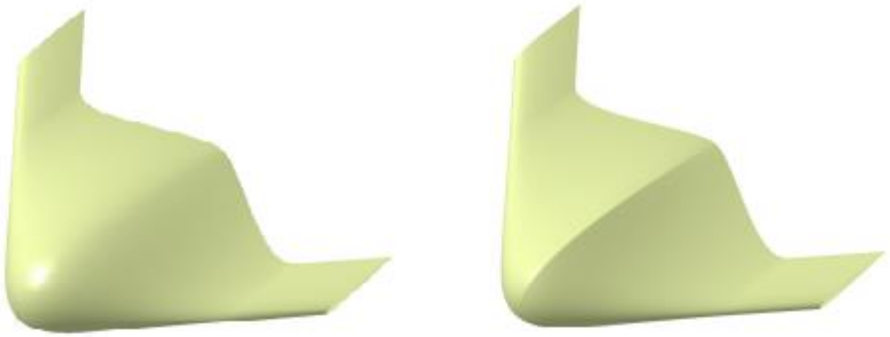
The Flying Wing Example

In this example a simplified outer shape of a flying wing UAV will be constructed.

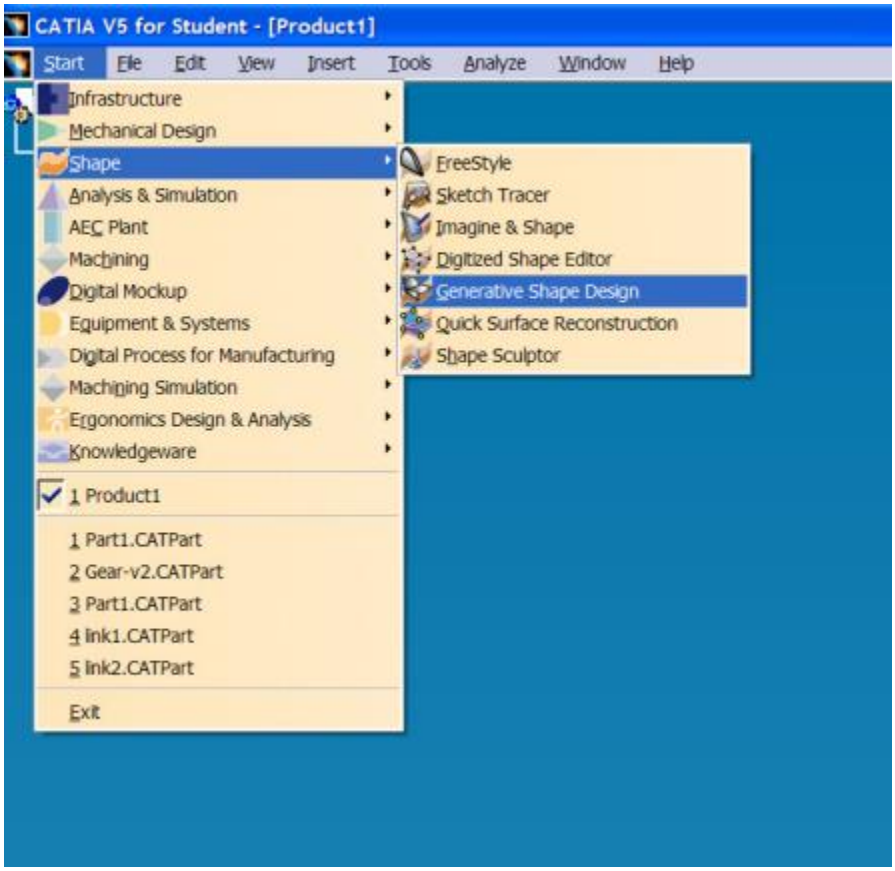
The objective of this exercise is to give the students a very basic understanding of the GSD workbench and how it can be used in a future multidisciplinary parametric framework.





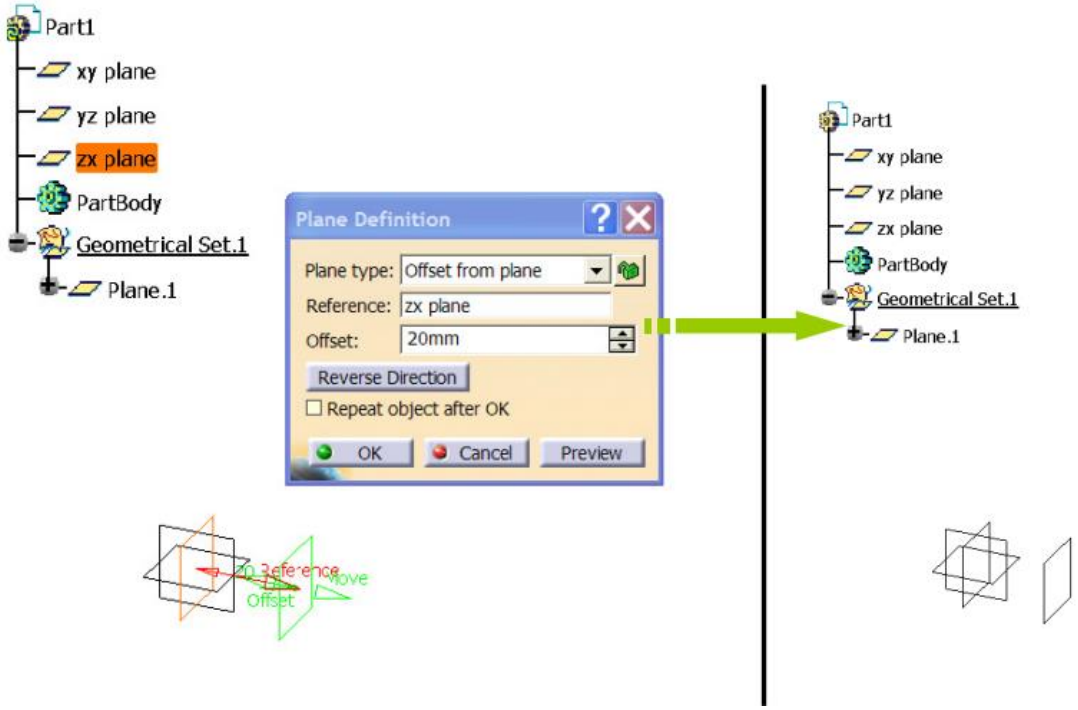
Step1

Enter the GSD workbench.



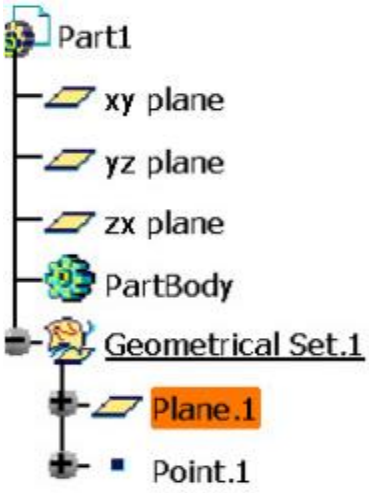
Step2

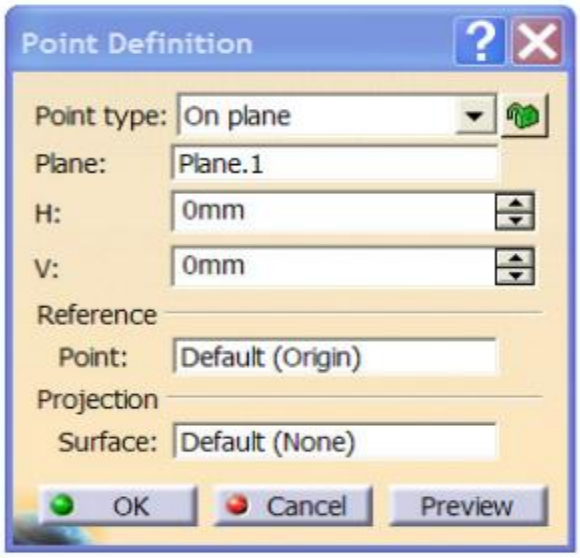
Create an offset plane, choose the zx plane as reference and 20mm Offset.

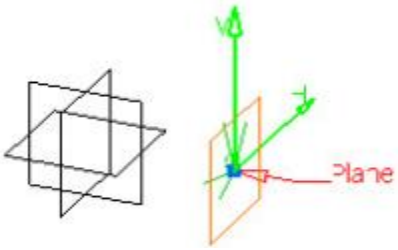


Step3

Create a point on Plane.1 with setting H and V values 0.

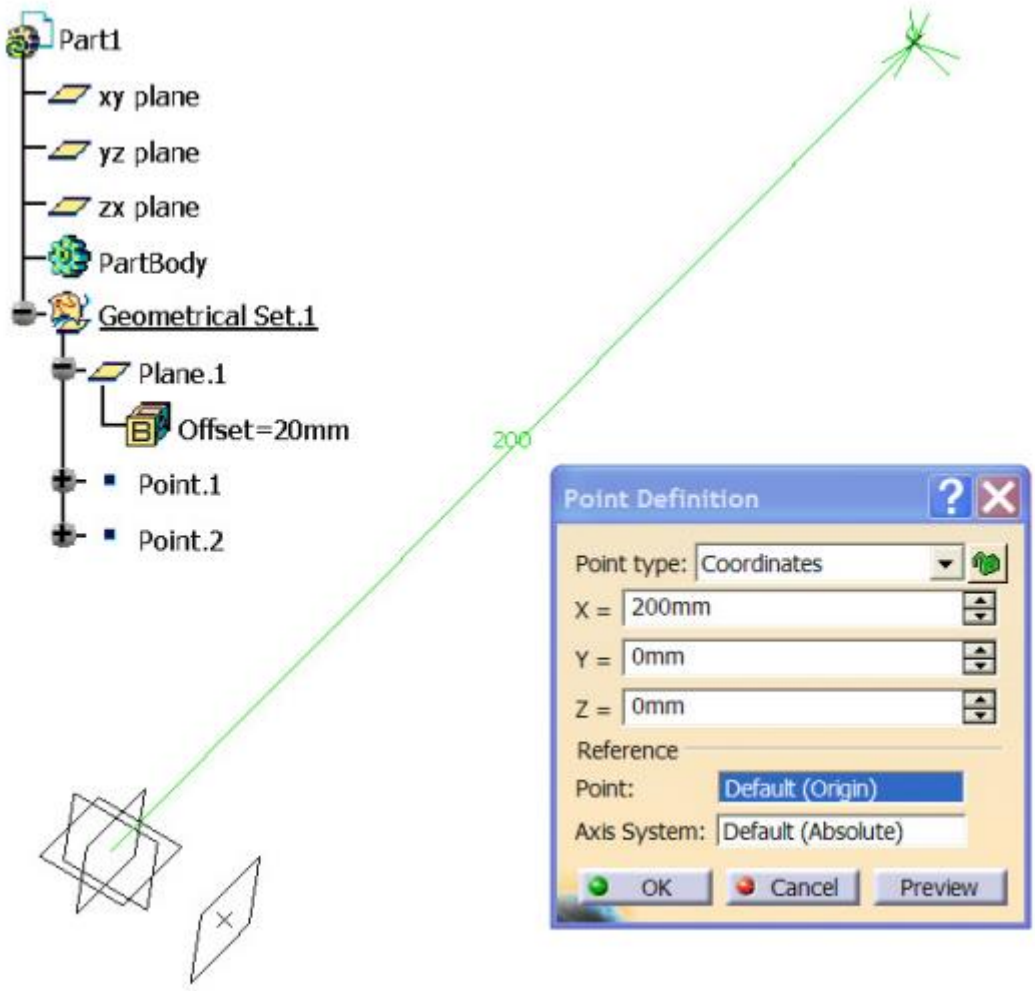






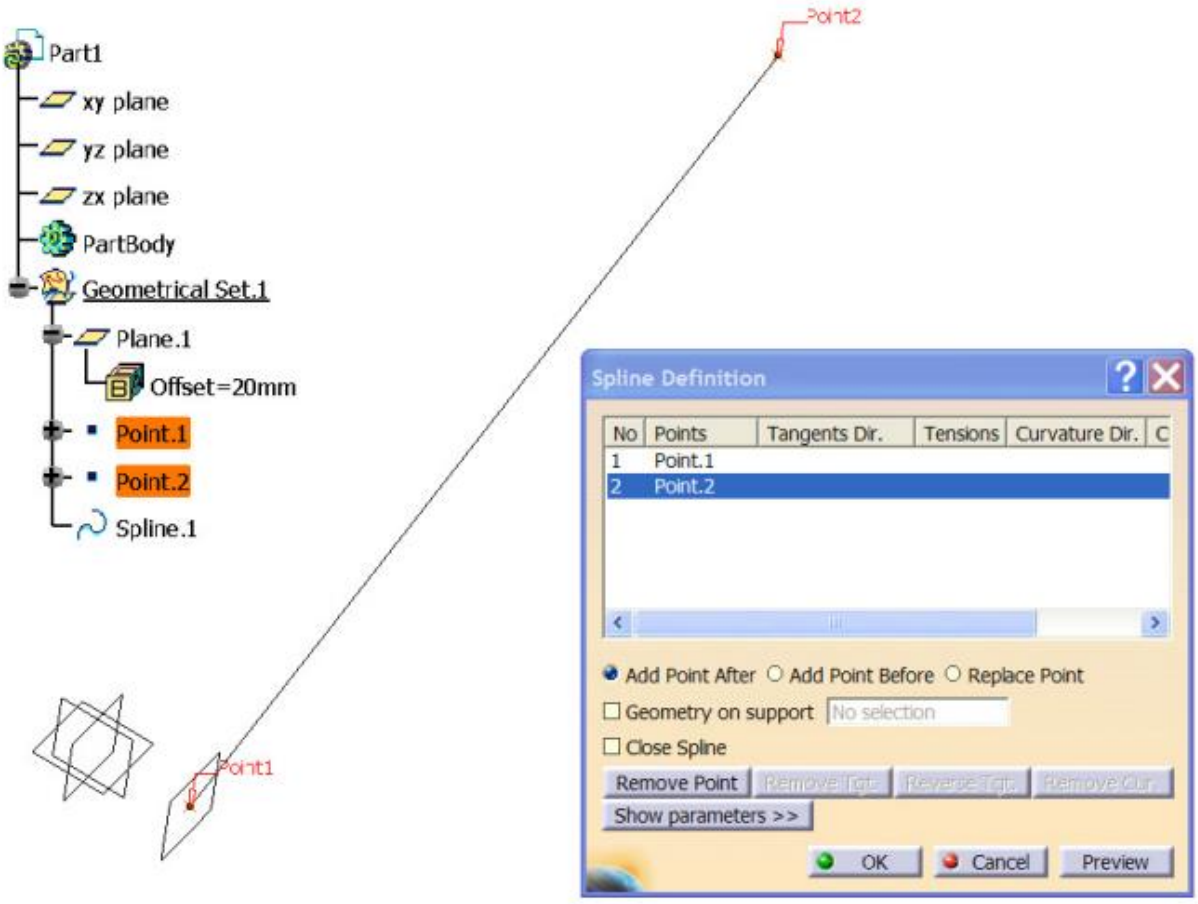
Step4

Create another point, set the point type to coordinates with a x value of 200 and the reference as Point.1



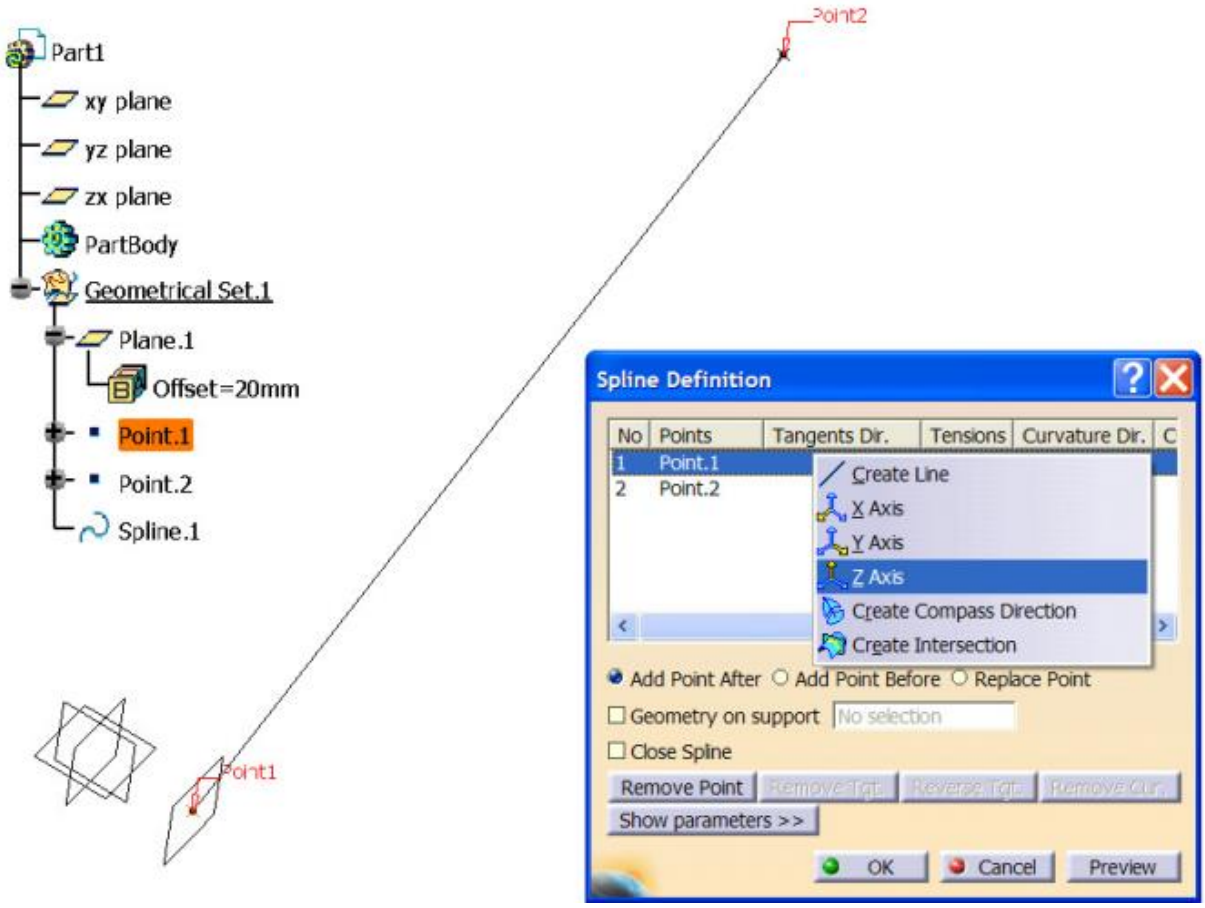
Step5

Create a spline through Point.1 and Point.2



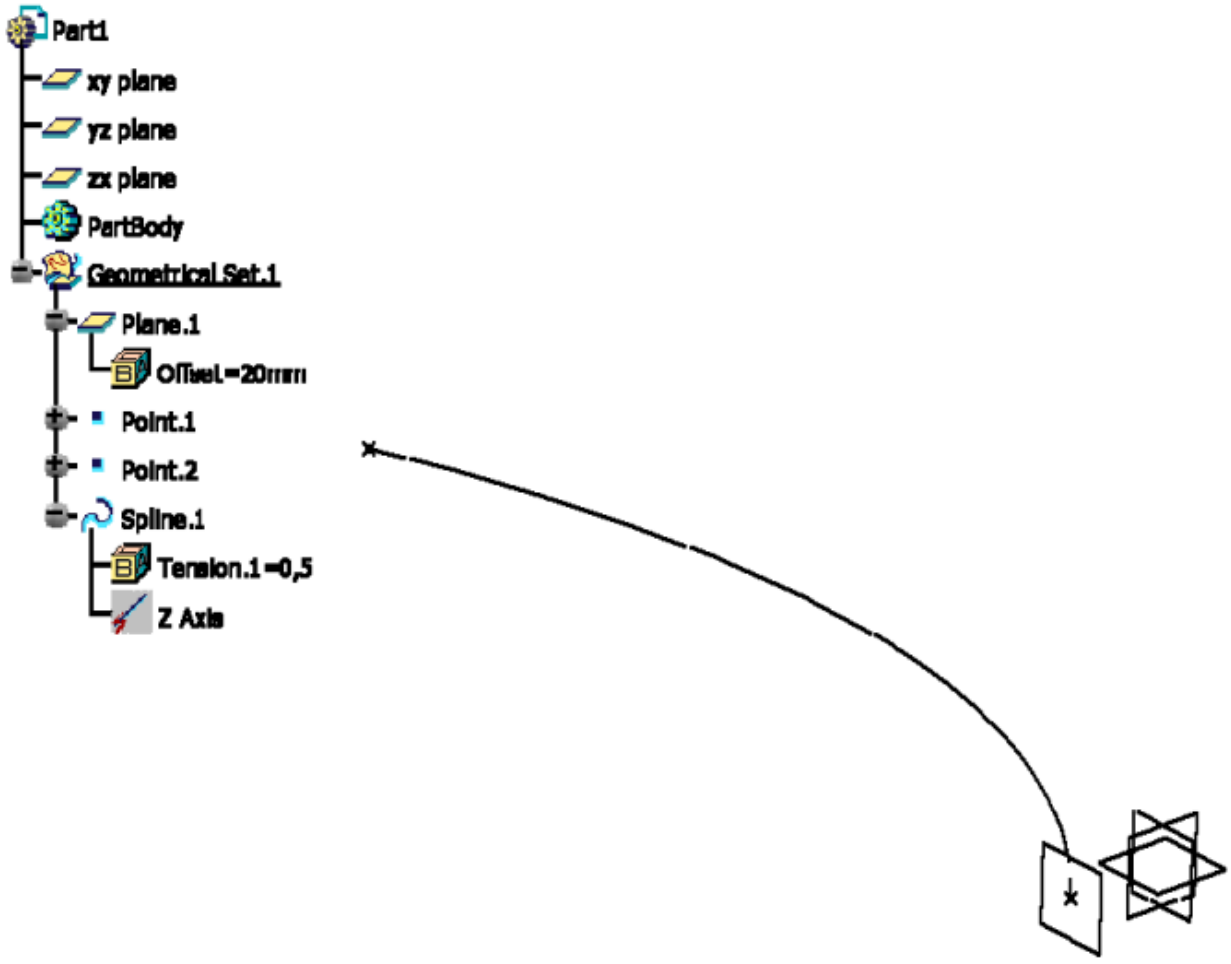
Step6

Create a Z axis tangency through Point.1



Step7

Change Tension.1 parameter under Spline.1 to 0.5



Step8

Create a spline through Point.1 and Point.2

Step9

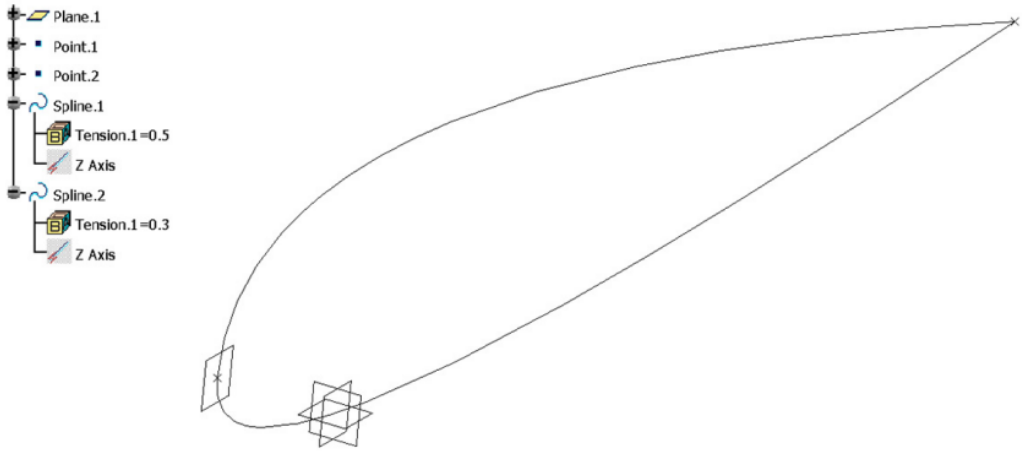
Create a Z axis tangency through Point.1

Step10

While in the spline tool, press "Reverse Tgt." so the spline goes in the opposite direction of Spline.1.

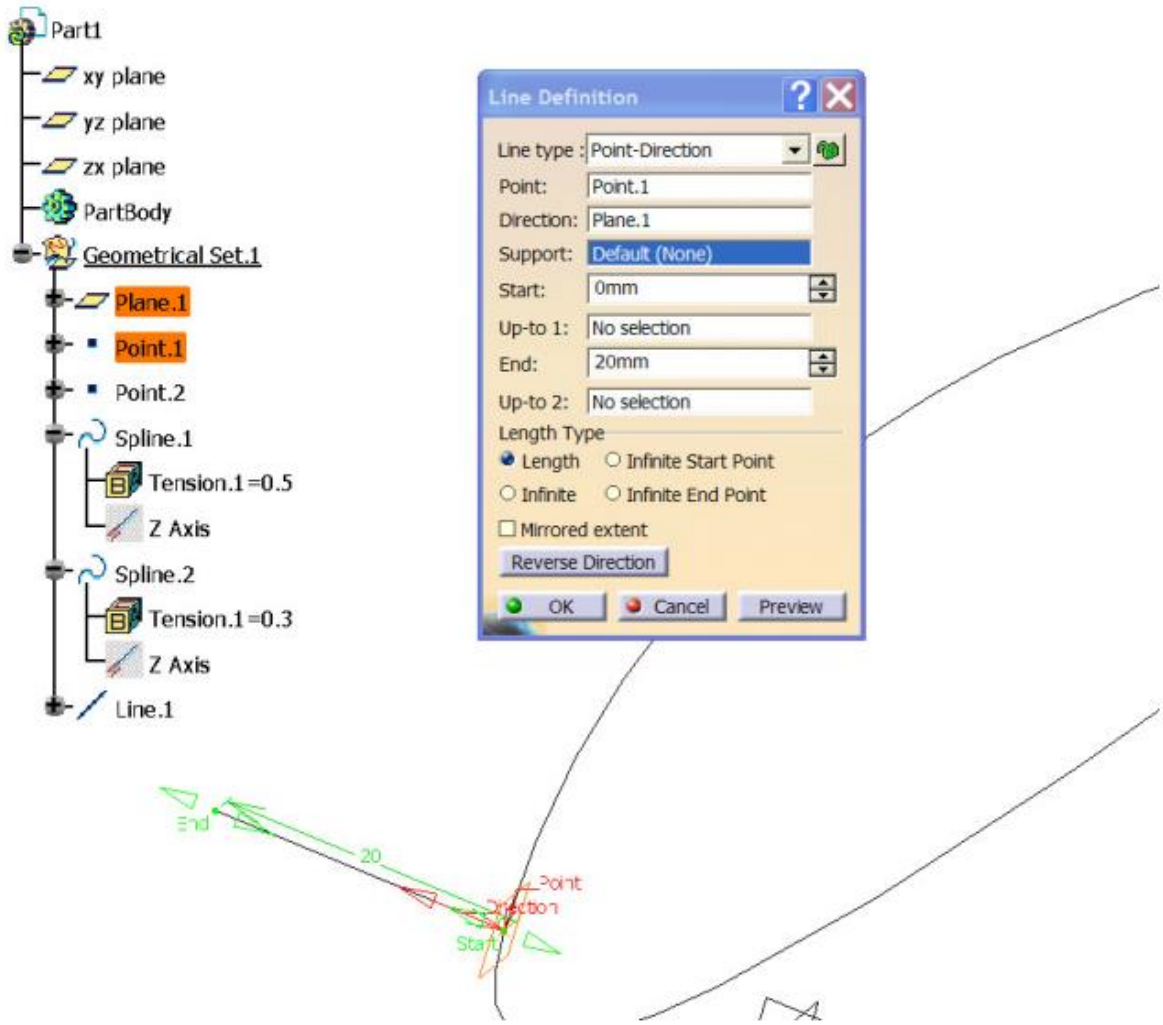
Step11

Change the tension parameter to 0.3.



Step12

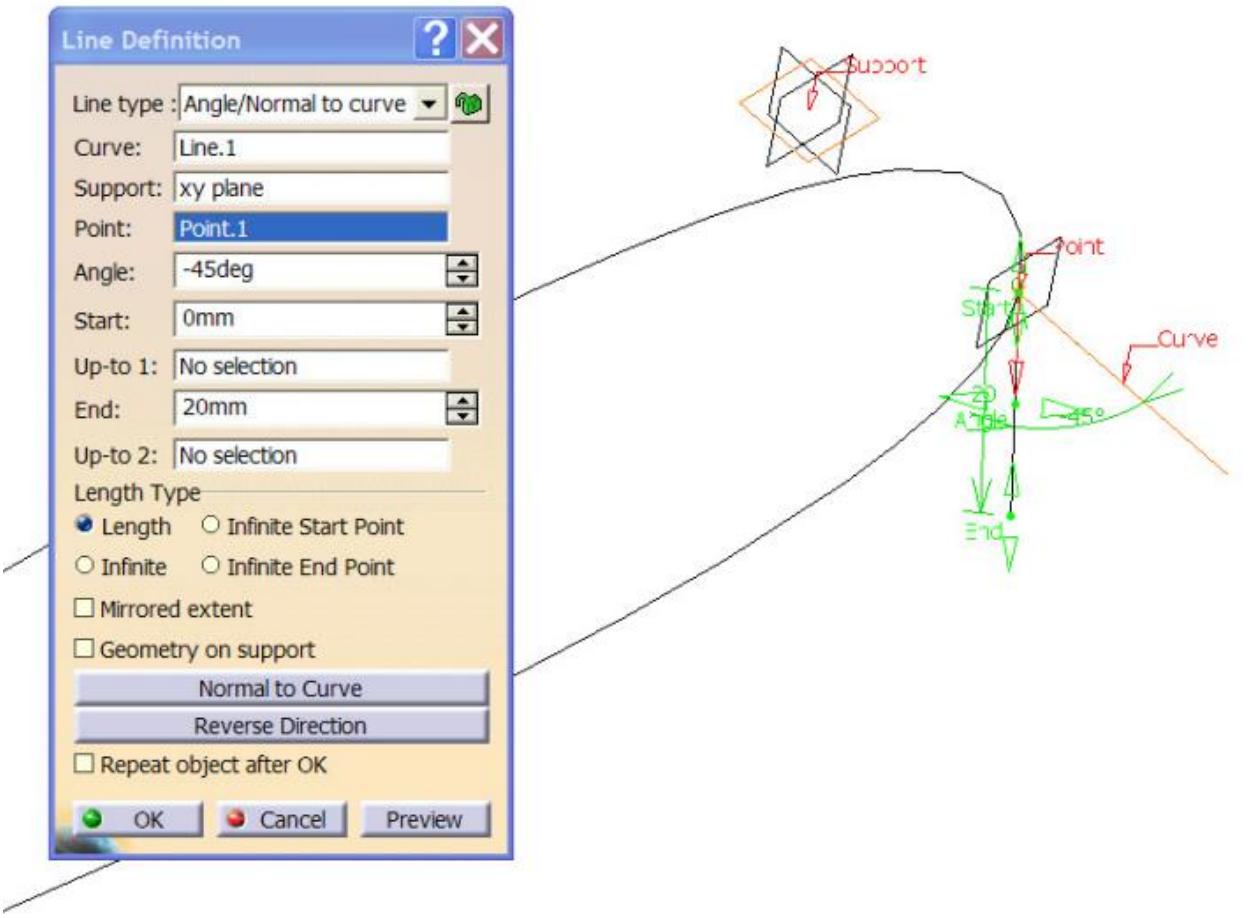
Create a Line, of type Point-Direction and choose Plane.1 as Direction and Point.1 as Point.



Step13

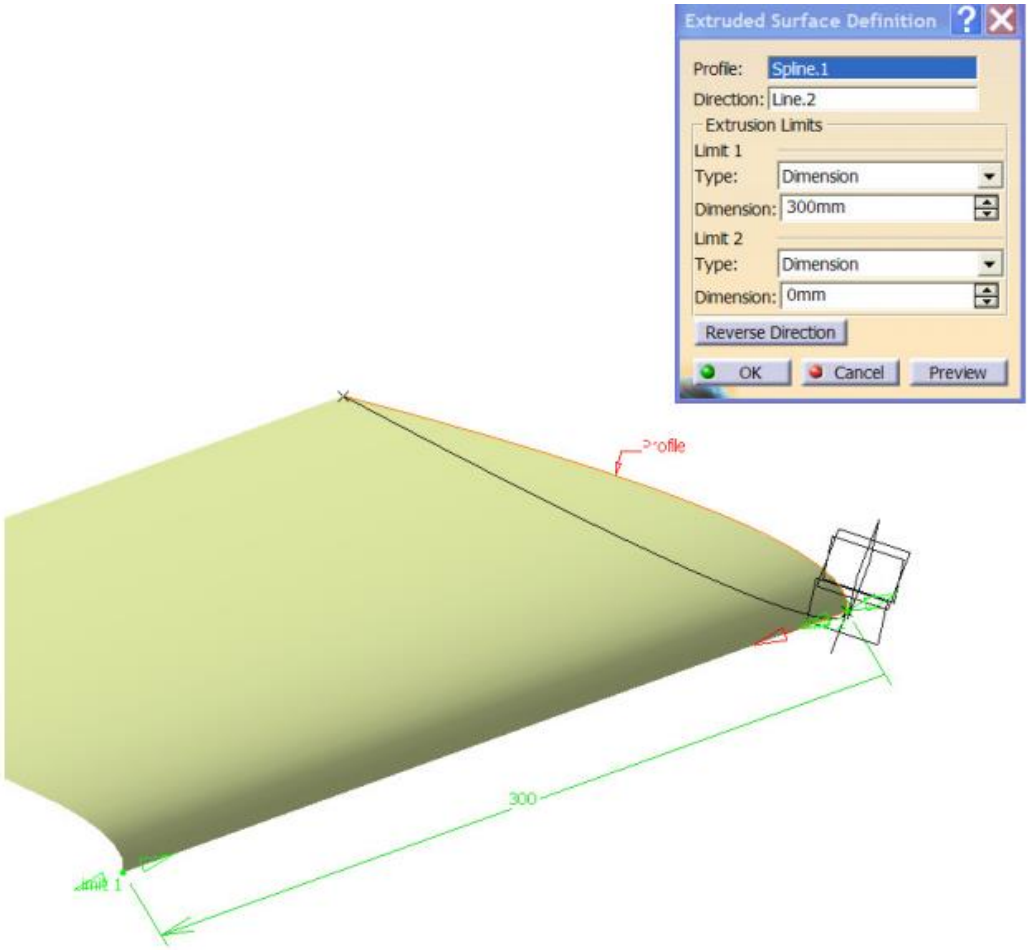
Create a line of type Angle/Normal to curve and choose Point.1 as Point, xy plane as Support and Line.1 as Curve.

Change the Angle to -45 deg



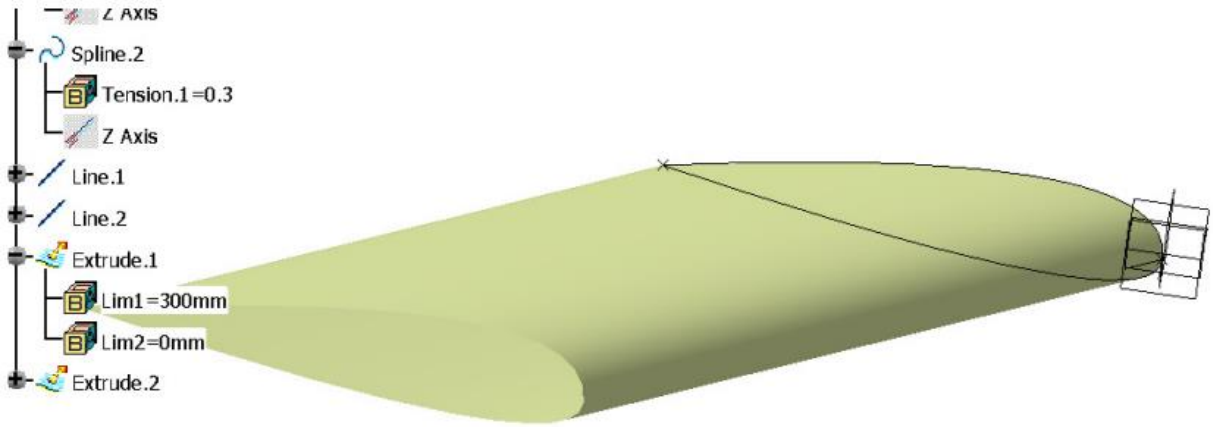
Step14

Choose the Extrude Surface tool and Choose Spline.1 as Profile and Line.2 as Direction



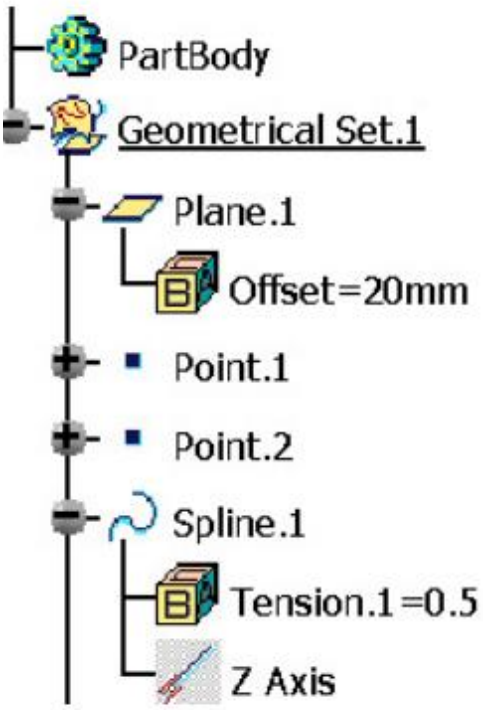
Step15

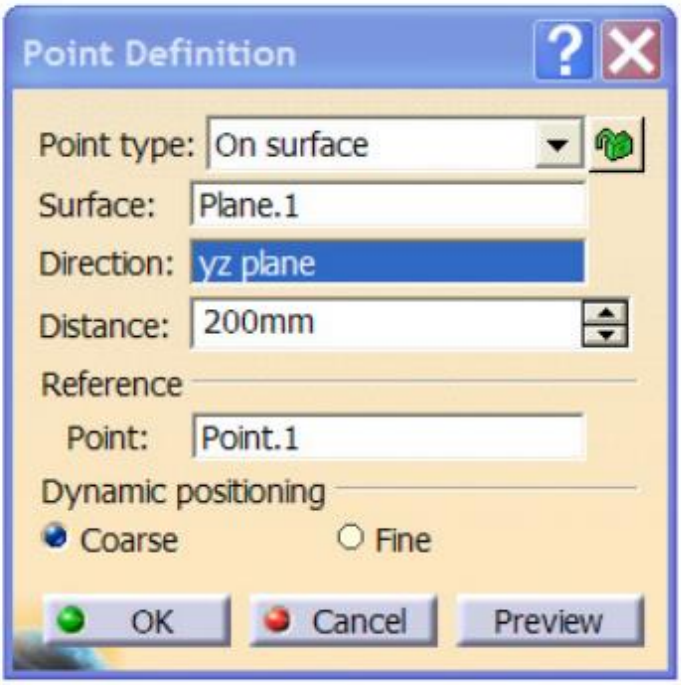
Choose the Extrude Surface tool again and Choose Spline.2 as Profile and Line.2 as Direction



Step16

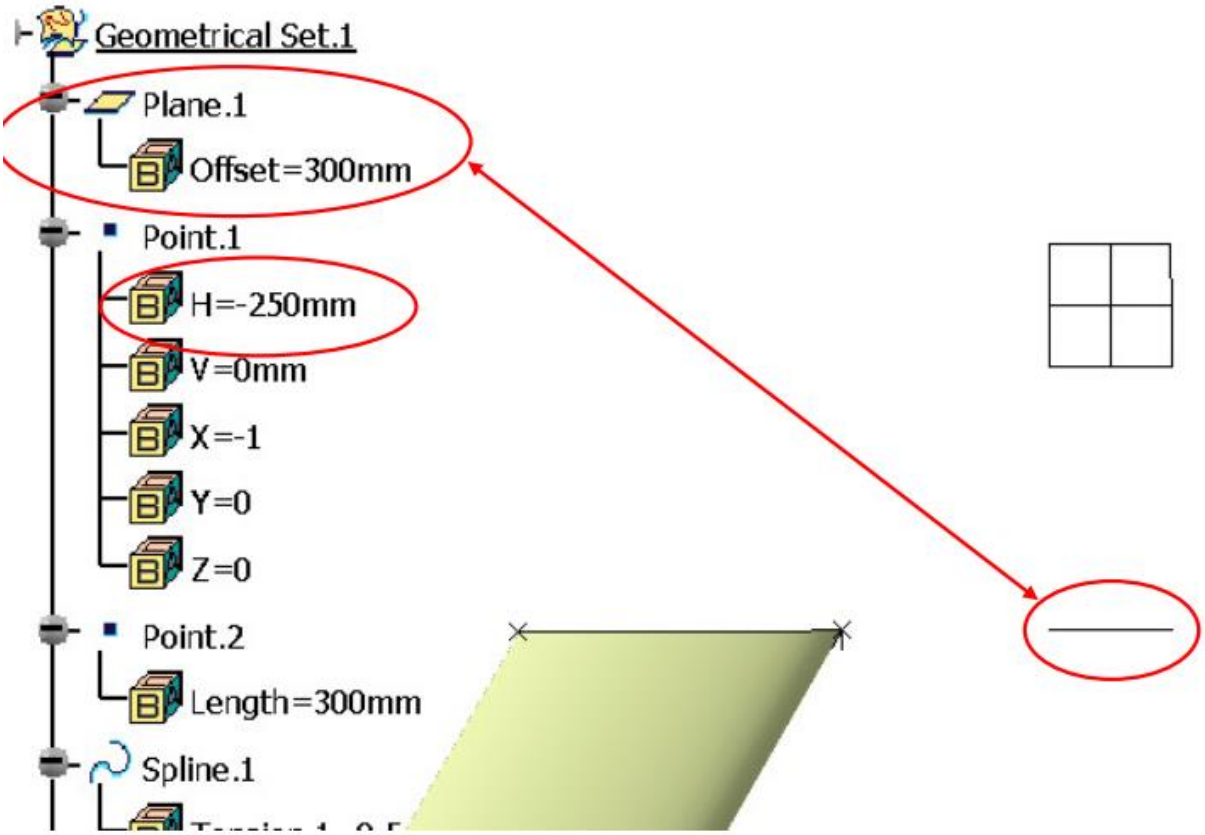
Change the Point type of Point.2 to the following. Change the direction to yz plan





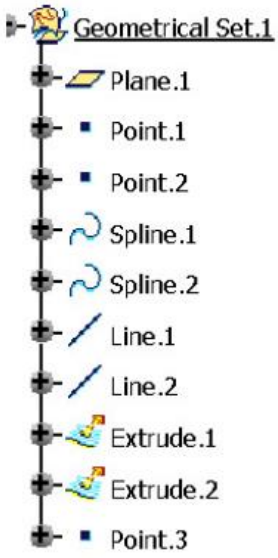
Step17

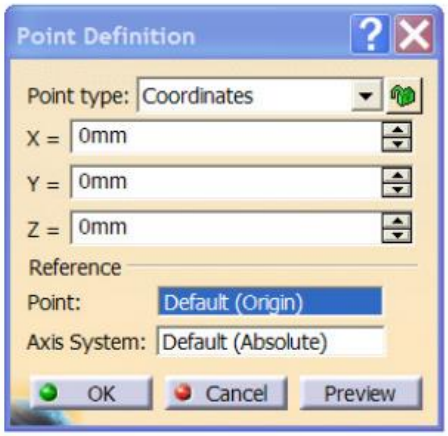
Modify Offset of Plane.1 to 300mm and H of Point.1 to 250mm

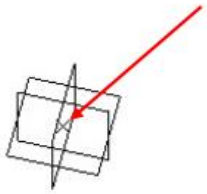


Step18

Create a new Point as following





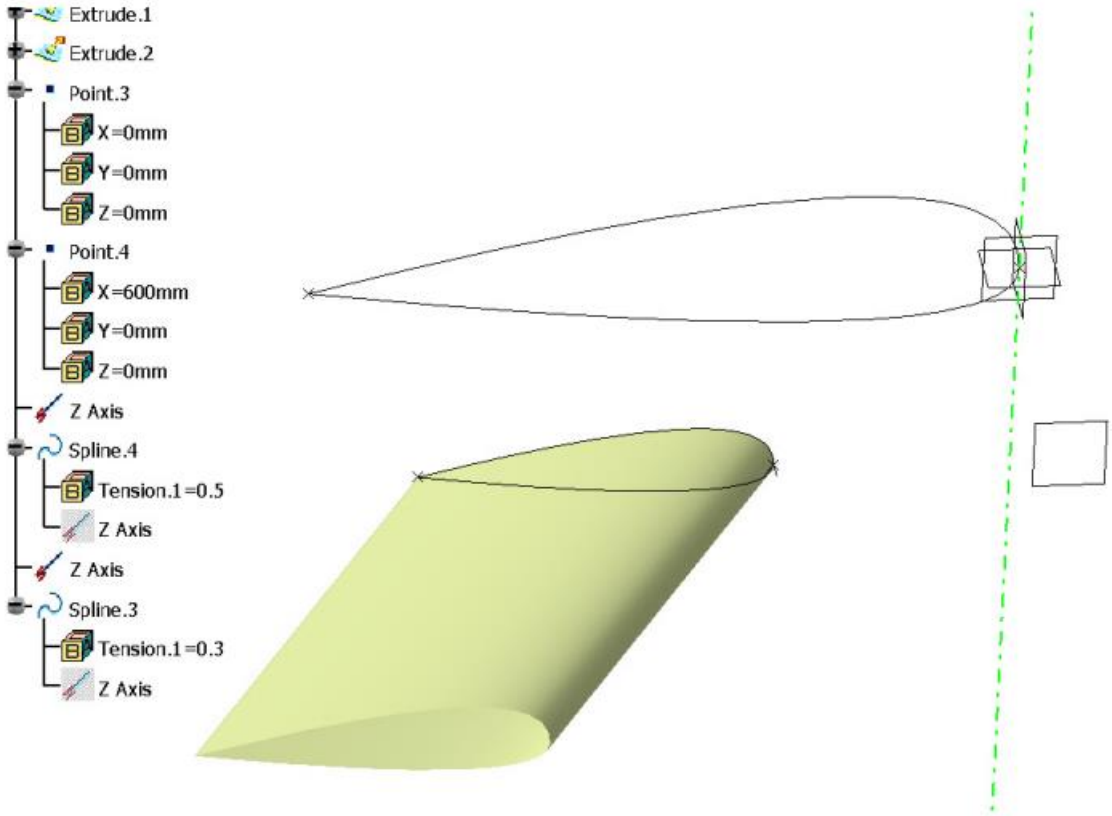


Step19

Create a spline through Point.1 and Point.3

Step20

Create a Z axis tangency through Point.1 by right clicking on Tangents Dir. on Point.1



Step21

Create a Spline through point.1 to point.2

Step22

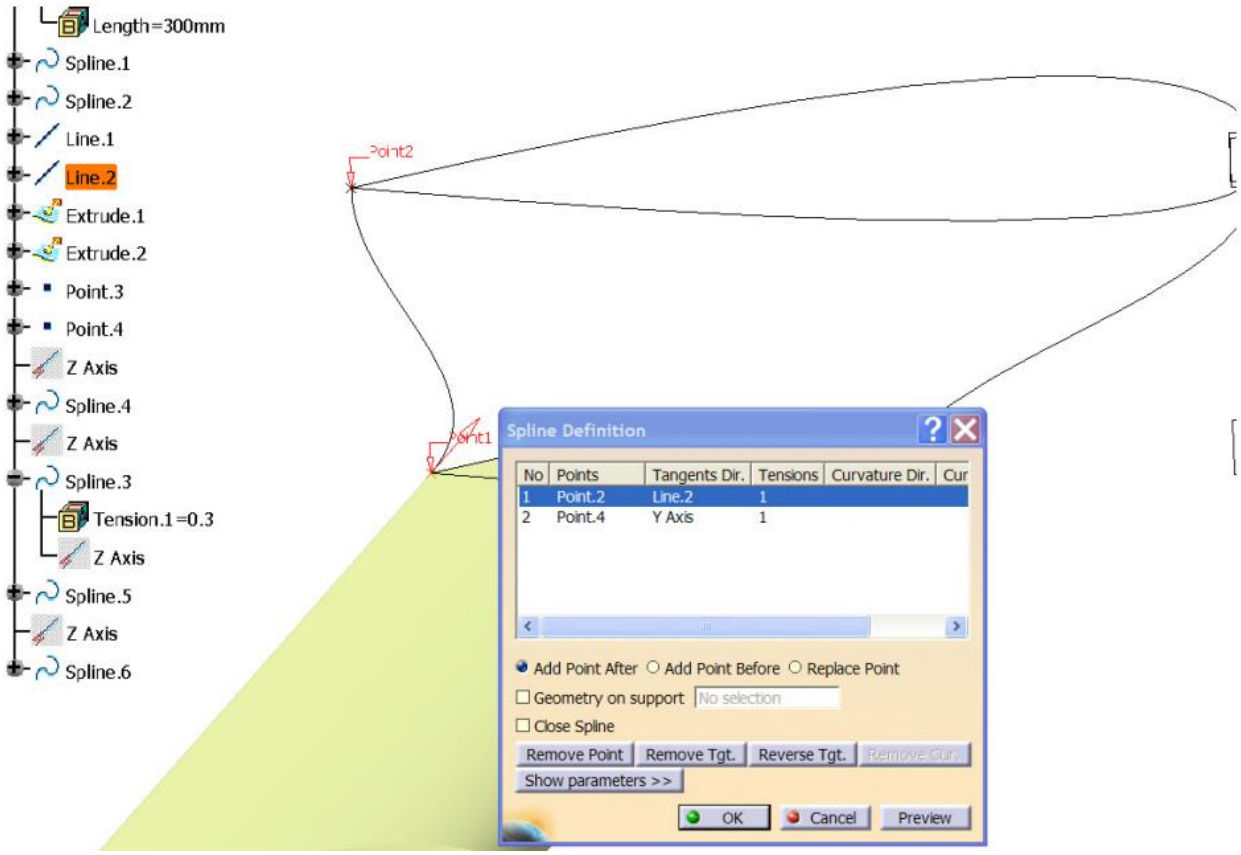
Create a Spline through point.3 to point.4

Step23

Create a Line.2 tangency through Point.2

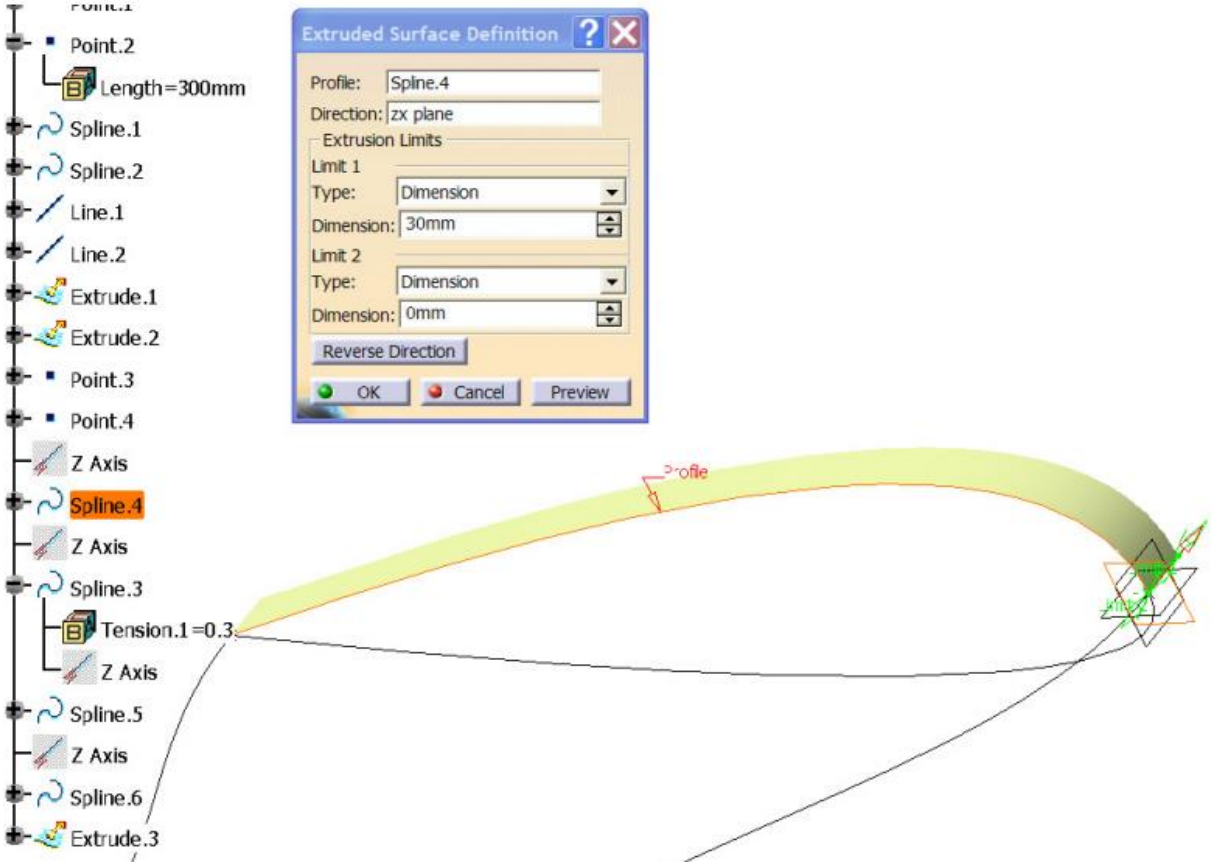
Step24

Create a Y Axis tangency through Point.4



Step25

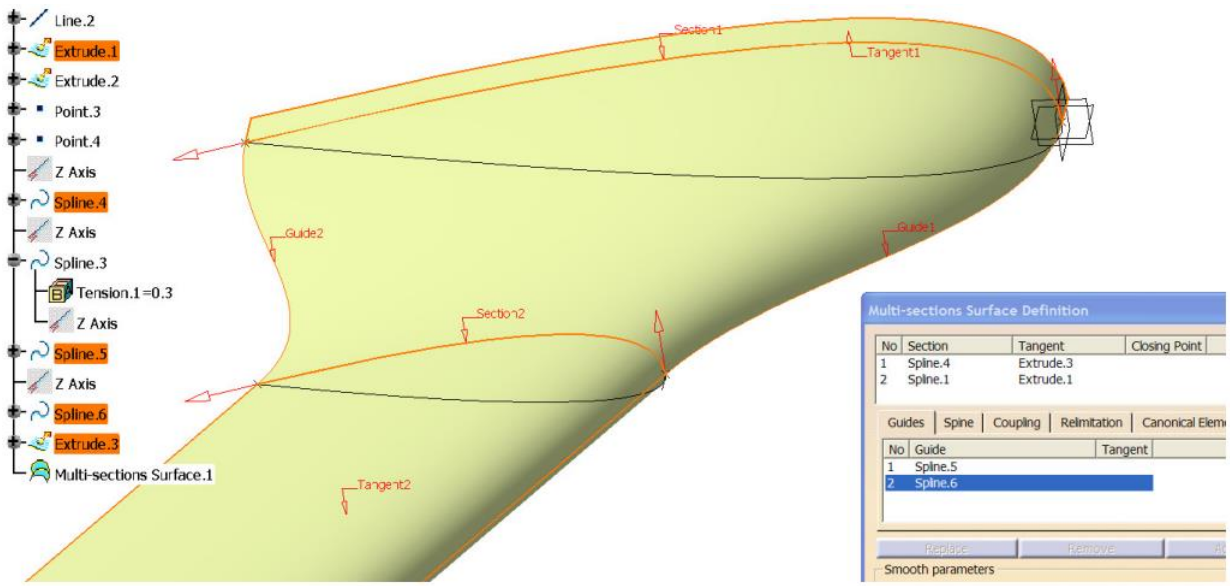
Create an Extrude Surface on Spline.4 This will be used as a Guide surface later. Use direction zx plane



Step26

Create a multi-section surface by choosing Spline.4 and Spline.1 as Sections and Spline.4 and Spline.6 as Guides.

Choose Extrude.3 and Extrude.1 as Tangent.



Step27

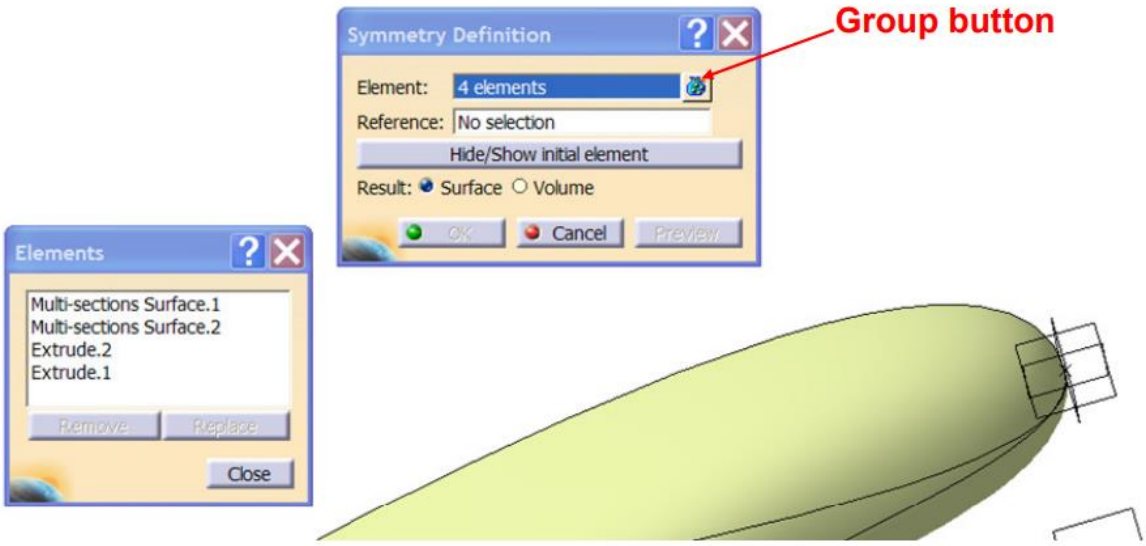
Create a multi-section surface by choosing Spline.3 and Spline.2 as Sections and Spline.5 and Spline.6 as Guides.

Choose Extrude.2 and Extrude.4 as Tangent.

Step28

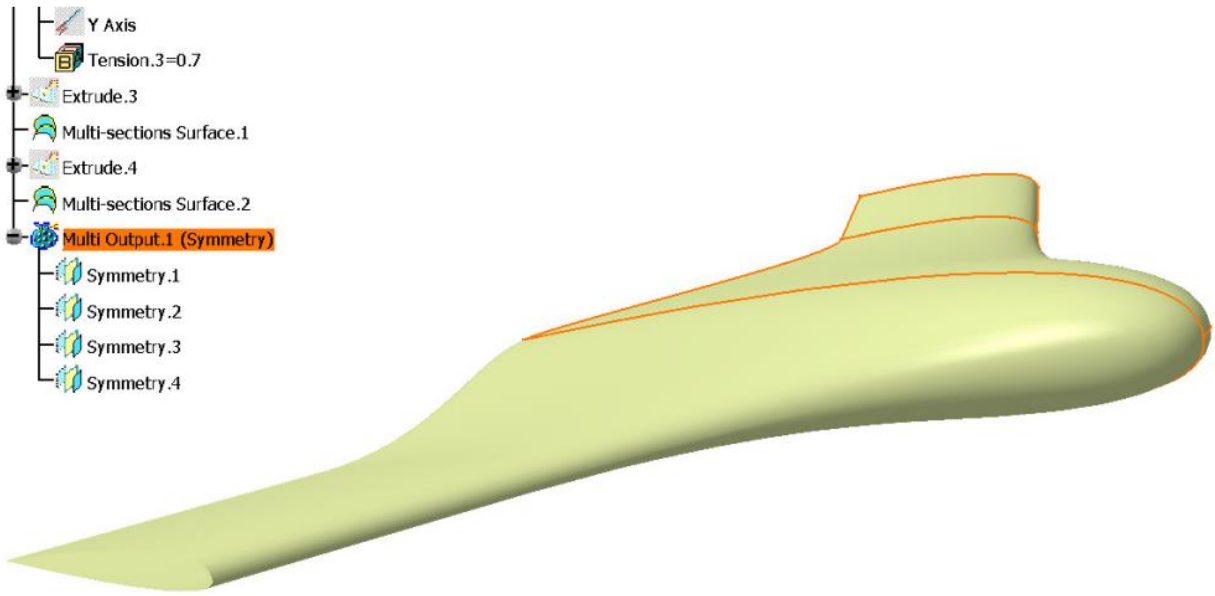
Choose the Symmetry tool and choose Multi-sections Surface.1, Multi-sections Surface.2, Extrude.2 and Extrude.1 as Elements,

Choose the zx plane as Reference



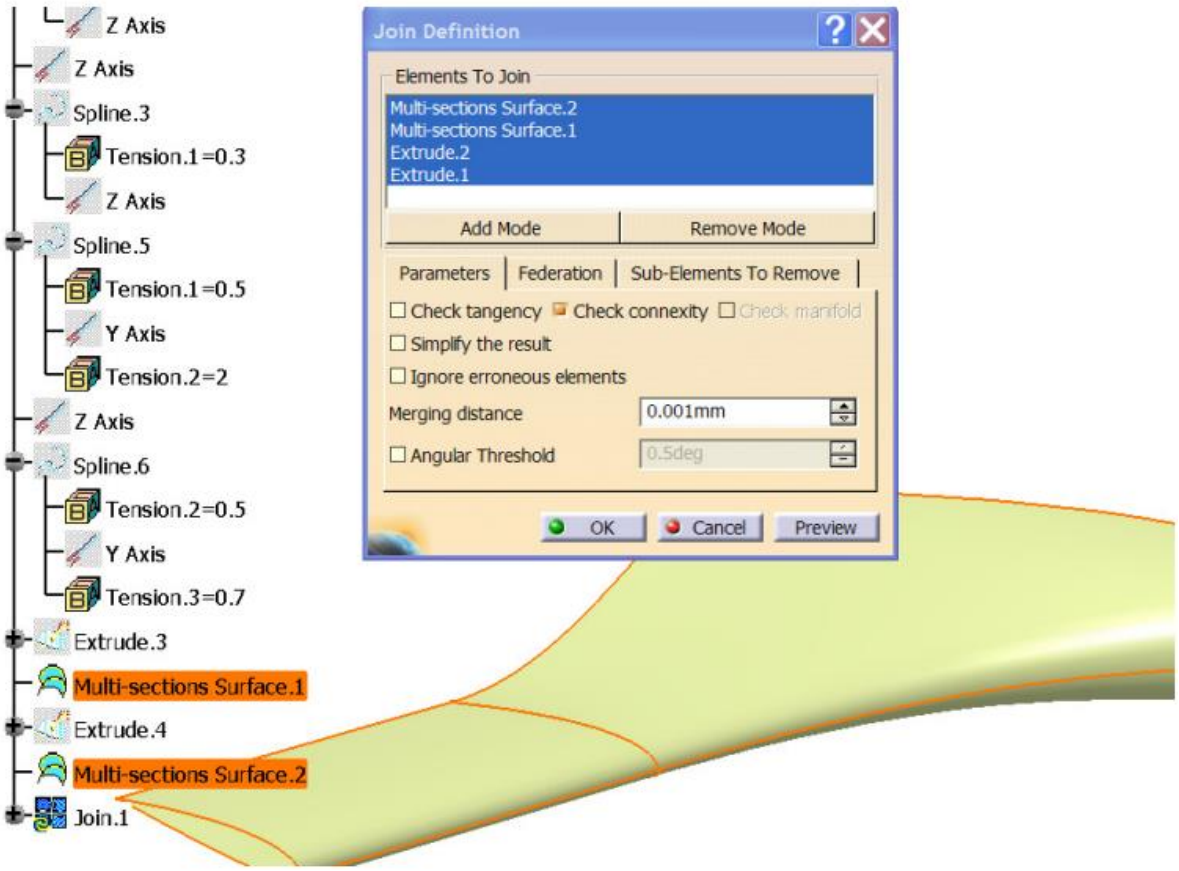
Step29

Delete the Multi Output.1 object.



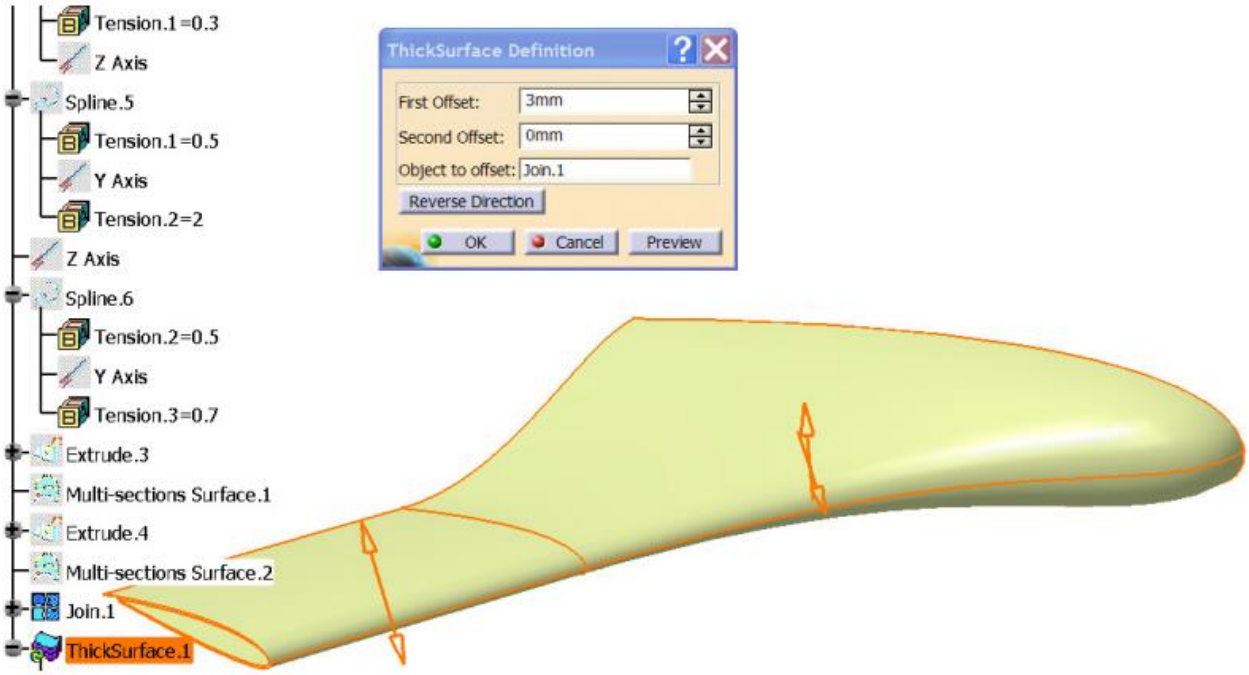
Step30

Select the Join tool and choose the Multi-sections Surface.2, Multi-sections Surface.1, Extrude.2 and Extrude.1 as Elements to join,



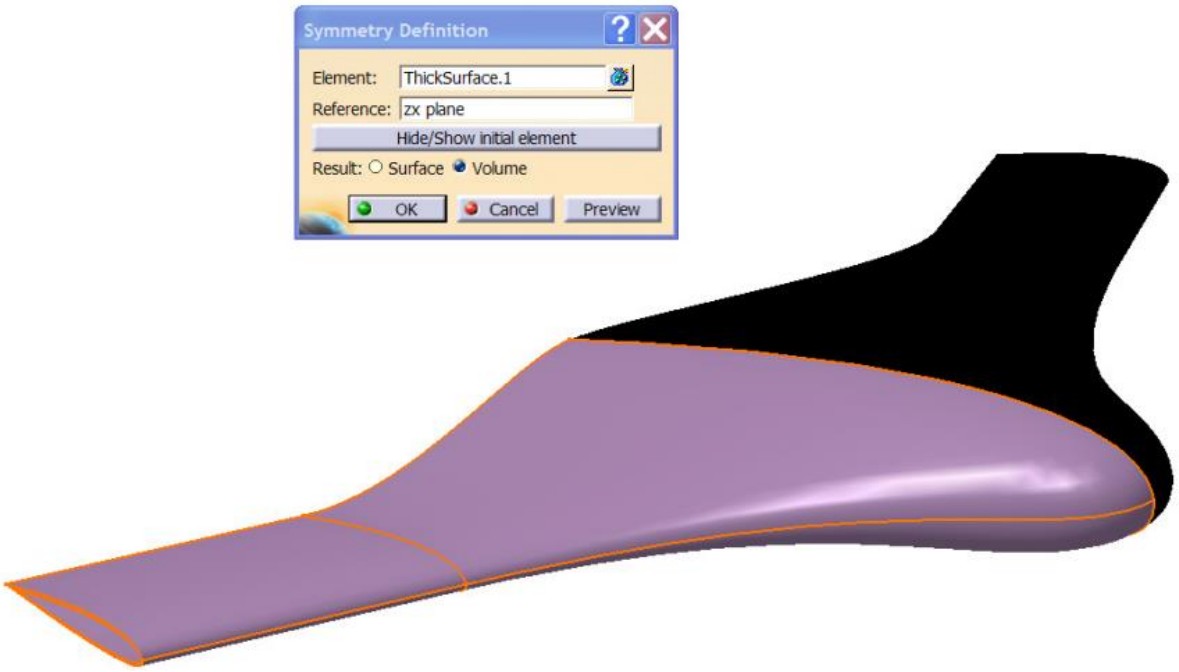
Step31

Select the Thick Surface tool and choose Join.1 as object to offset, and give a first offset of 3 mm.



Step32

Select the Symmetry tool and choose ThickSurface.1 as Element and zx plane as Reference.


Symmetry Definition
Element:
ThickSurface.1
Reference:
zx plane
Hide/Show initial element
Result:
Surface
Volume
OK
Cancel
Preview