



Tools introduced in following tutorial:



- Boundary Blend



-Project



- Datum Points



- Curve through points

The first challenge to be faced will be handle shown on the left.

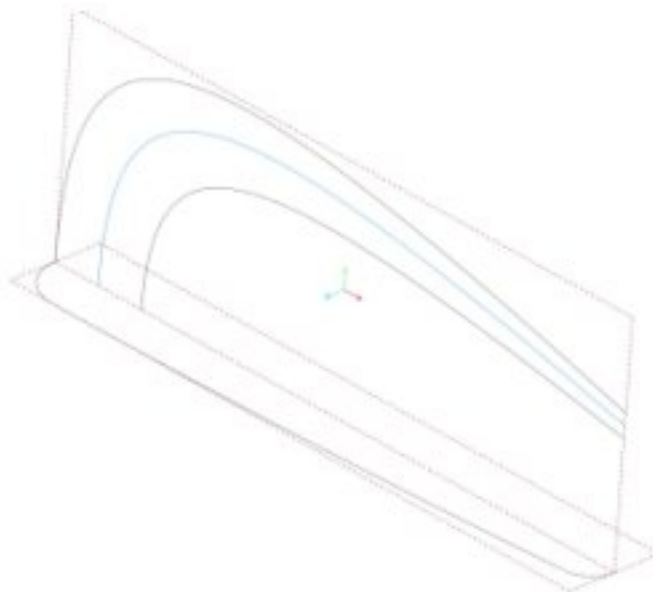
There are enough "curvy" shapes to introduce a lot of problems while trying to make it in solids.



The very first step one should consider before laying down any sketch is shape analysis.

Such handle one can describe by preparing its "side" and "top" boundaries as sketched curves. In addition creating extra curves to handle inner profile.

The best suited tool for such introduced conditions is Boundary Blend.

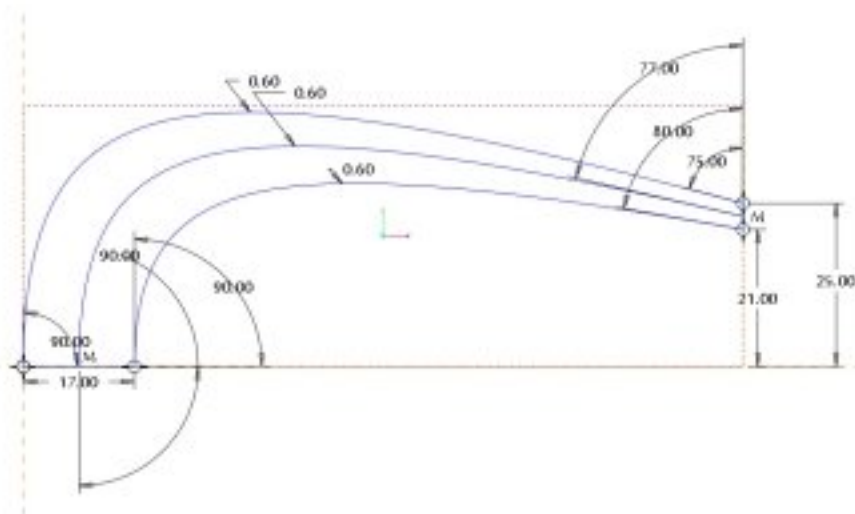


First curves that introduce overall size should be created (simple rectangles).

It is good idea to change display of those curves by RMB > Properties to distinguish them among others.

Next step is to create main "Contours" as sketched curves.



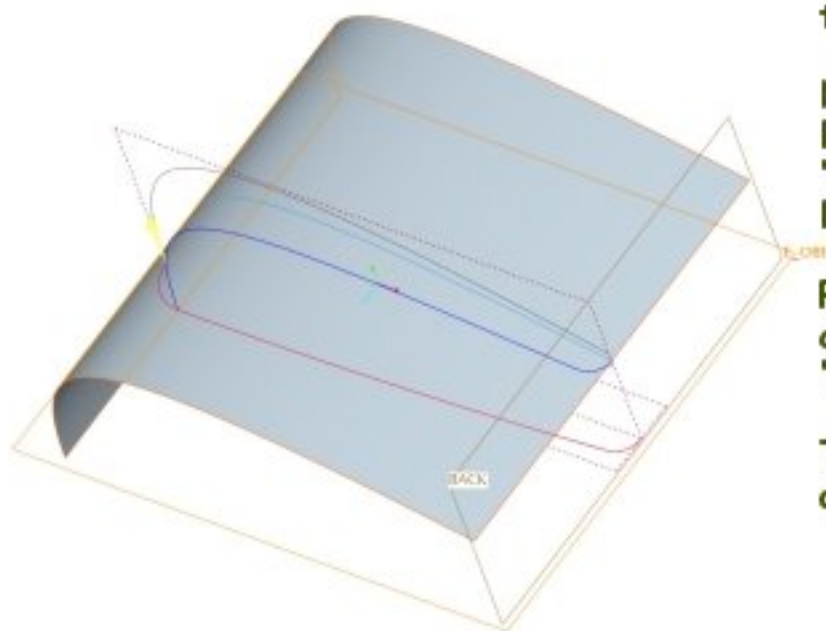


Side contours can be created as one sketch. In this example Conic arcs are used.

Conic arcs have such advantage that their Curvature is not constant.



Try to create same sketch as on the left.

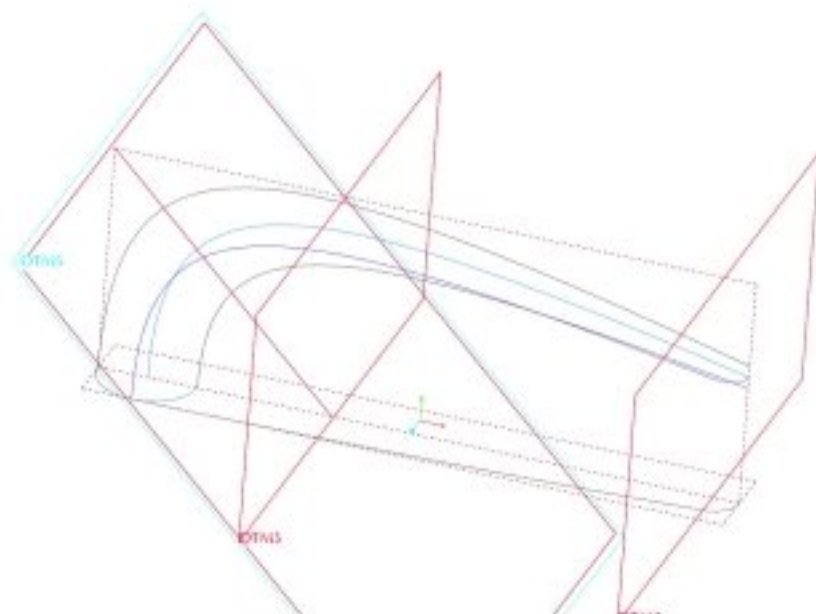


Now, prepare contour seen form top view.

Next step is to create surface based on the middle curve from "Side Contour". This can be done by Extrude tool.

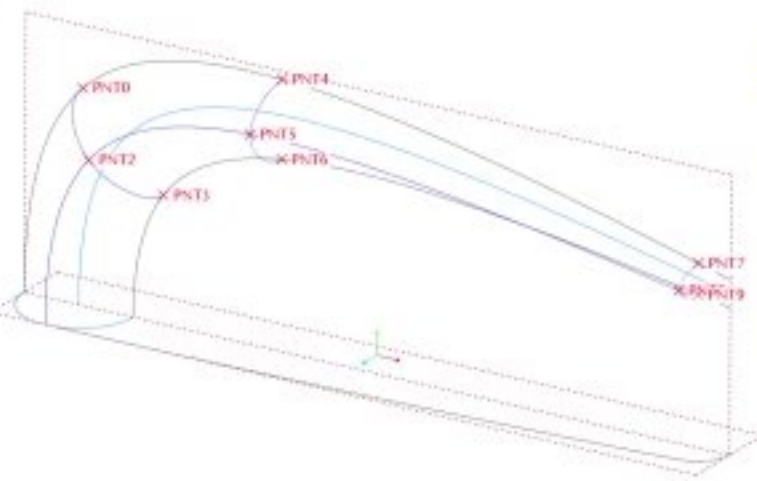
Project "Top Contour" on just created surface. As the result "non-planar" side curve is obtained.

This can be achieved also by use of Intersection tool



Create 3 datum planes for extra curves.

First datum plane is created with an advantage of sketched curve.



Use datums planes and sketched contours to create Datum Points

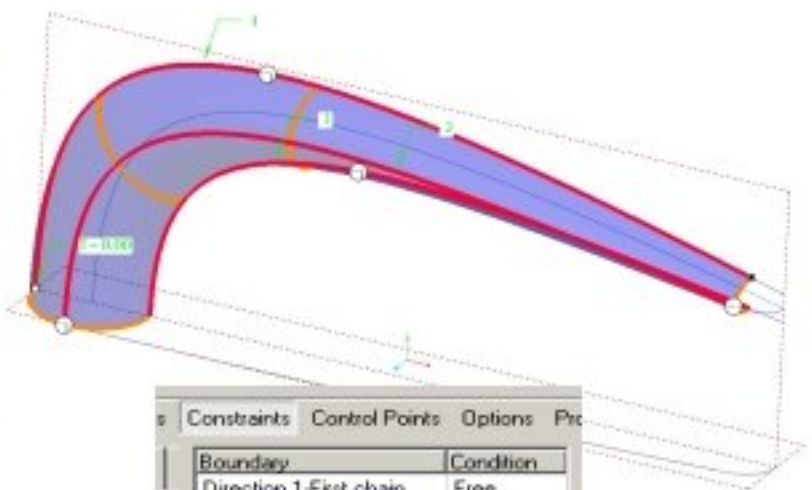
Notice - more than one point can be created in this feature. Make sure You have three features with tree points inside

Create three Curves through points using just created datum points.

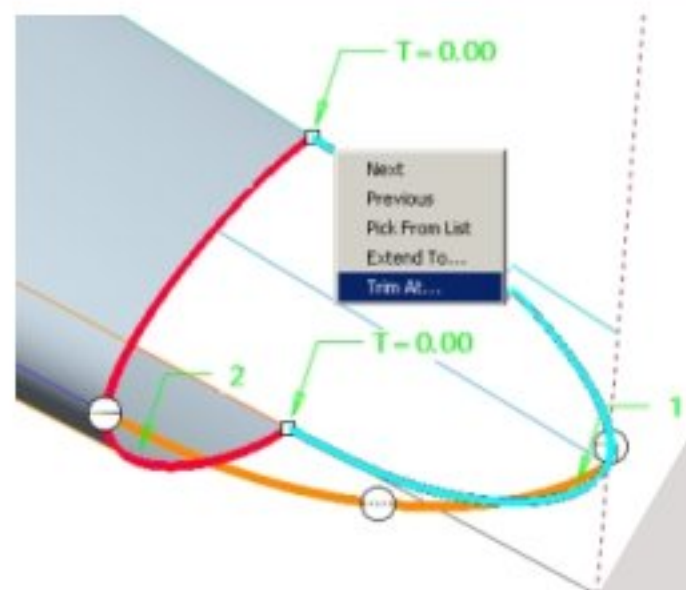
When all curves are created there is right time to prepare main surface with Boundary Blend tool.

Take a look on the picture at the right side. Collect red curves for the first direction. For the top and bottom curve set "Normal" condition.

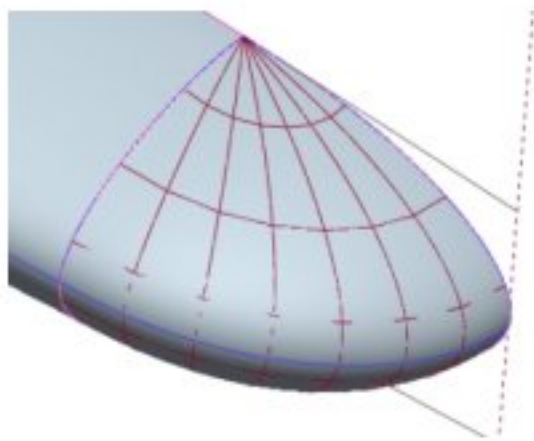
For the second direction collect curves displayed in orange on the picture at the right side.



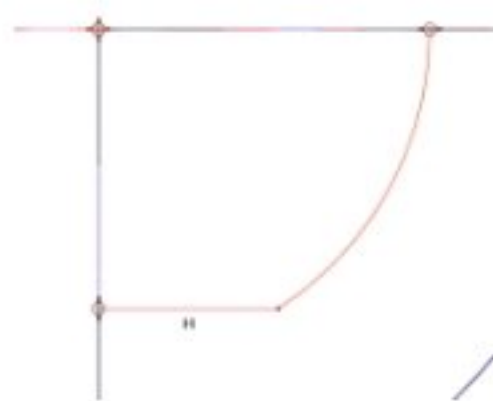
Now we have to create "closure" surface at the rear side. First prepare "closure" curve by Curve through points. Next - create surface by Boundary Blend. Collect red and blue curve displayed on the pic at the right side for 1st direction. Collect orange curve for 2nd dir. Set Normal condition for blue curve and tangent for red one.



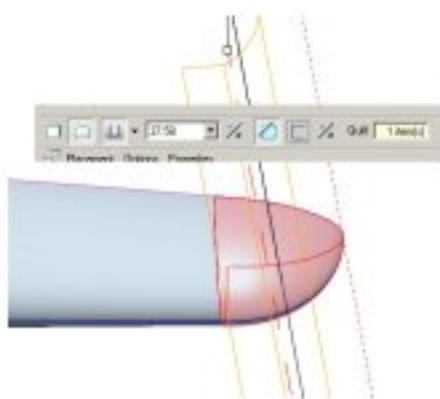
Surface created in this way - 3 curves - are considered as not desired ones. The quality - mesh - of such surfaces are often below expectations!



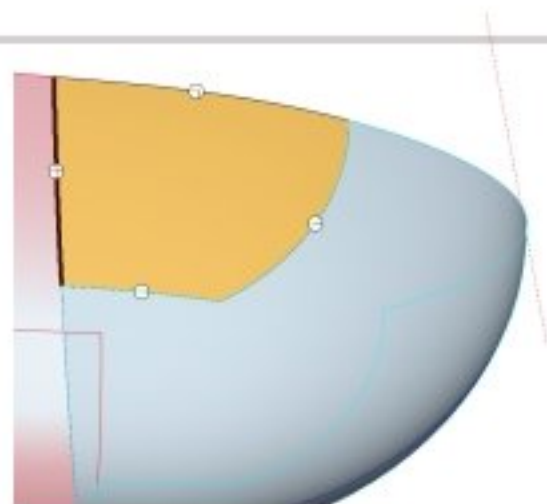
The problems with a mesh one can test by use of View > Model Setup > Mesh Surface



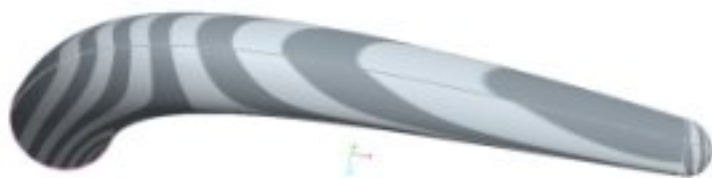
There are few ways to solve this case. In this tutorial we are going to remove such piece of surface and replace it by proper one. Make following sketch(arc+line)



Project sketch on to surface and trim it by Edit > Trim



Now we have for boundaries, which are best conditions for Boundary Blend. Create new surface to fill a gap.



Join all surface in one big quilt - Edit > Merge. Make a mirror copy of it - Edit > Mirror



There is the time to check light reflection - Analysis > Geometry > Reflection



You can notice areas where curvature change its value or direction.