



# **EN1740 Computer Aided Visualization and Design**

Spring 2012

3/1/2012

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***Last time:***

- Measure
- Shell
- Surfaces
  - Best practices/Appropriate Uses
  - Parametric
    - From standard features

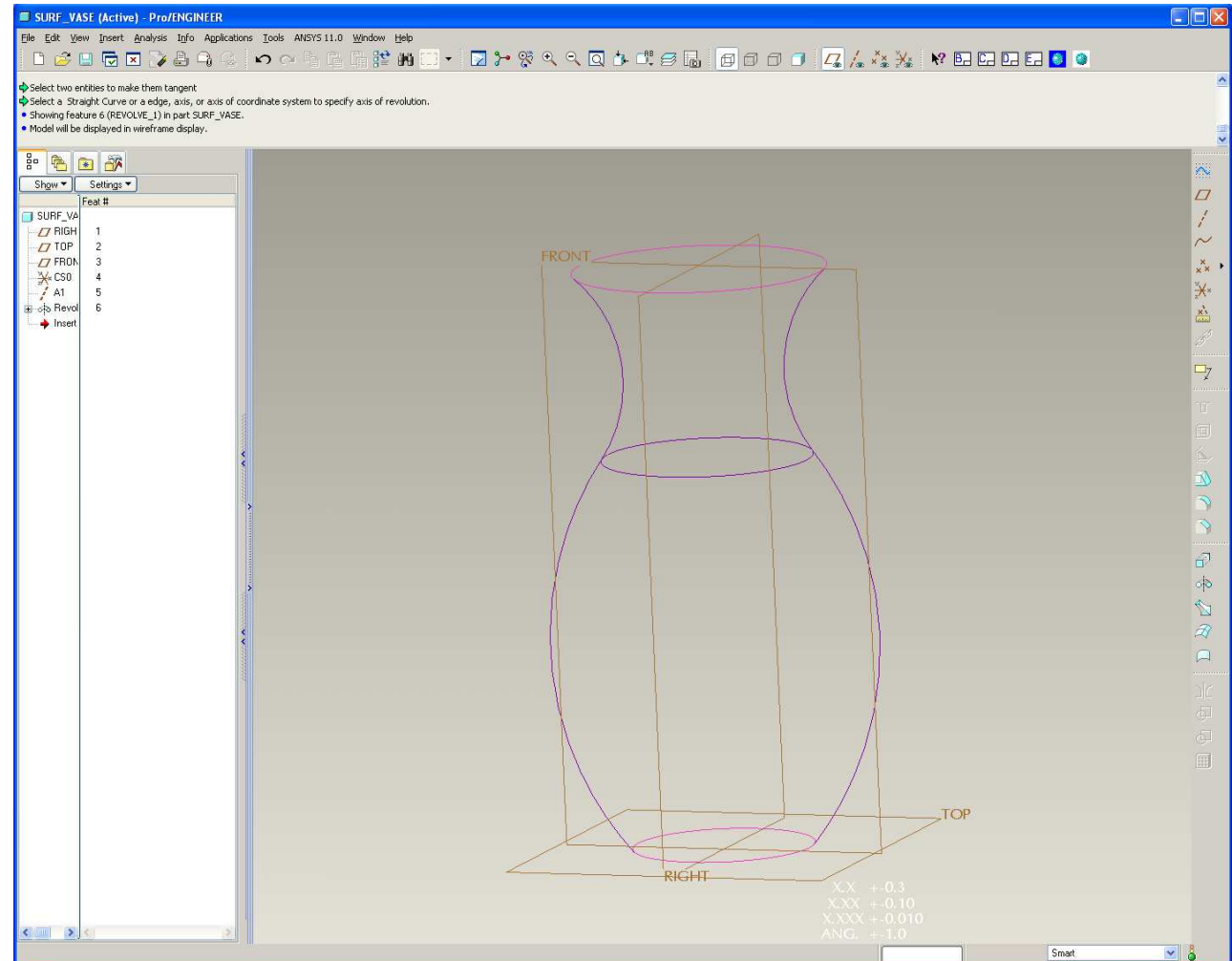
***Tonight:***

- Finish intro to surfaces
  - From standard features
  - From curve boundaries
- Free-form (Style features)



## EXERCISE – Vase from Surfaces

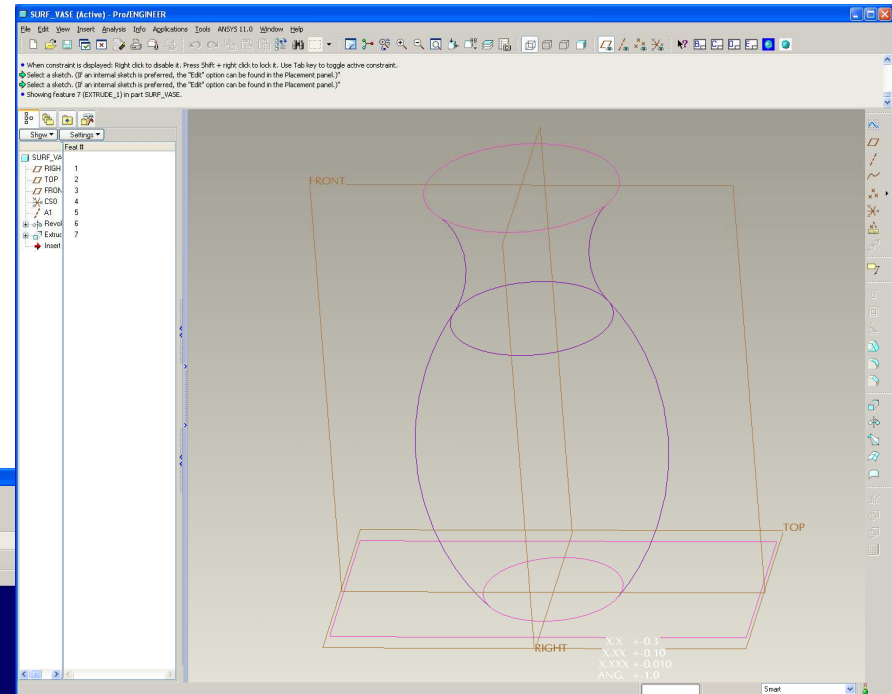
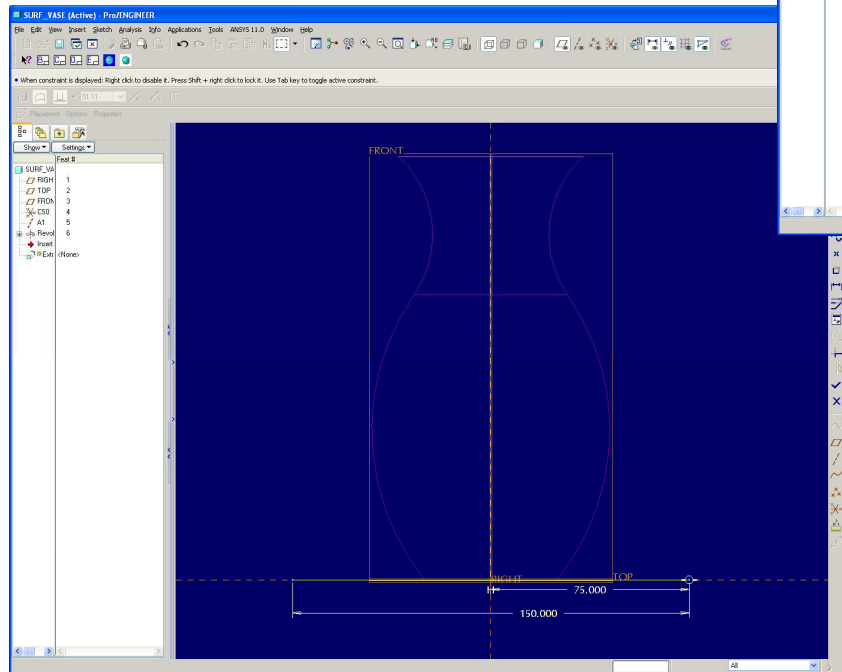
- Revolve section a full **360** deg.
- Notice the open and closed ends of the Quilt





## EXERCISE – Vase from Surfaces

- Create an Extrude surface 150 X 75
  - Use previous Sketch references
  - Toggle to Extrude as surface
  - Extrude Both Sides, 75





## EXERCISE – Vase from Surfaces

- Highlight the Revolve and the Extrude

in the Model tree

- Edit > Merge

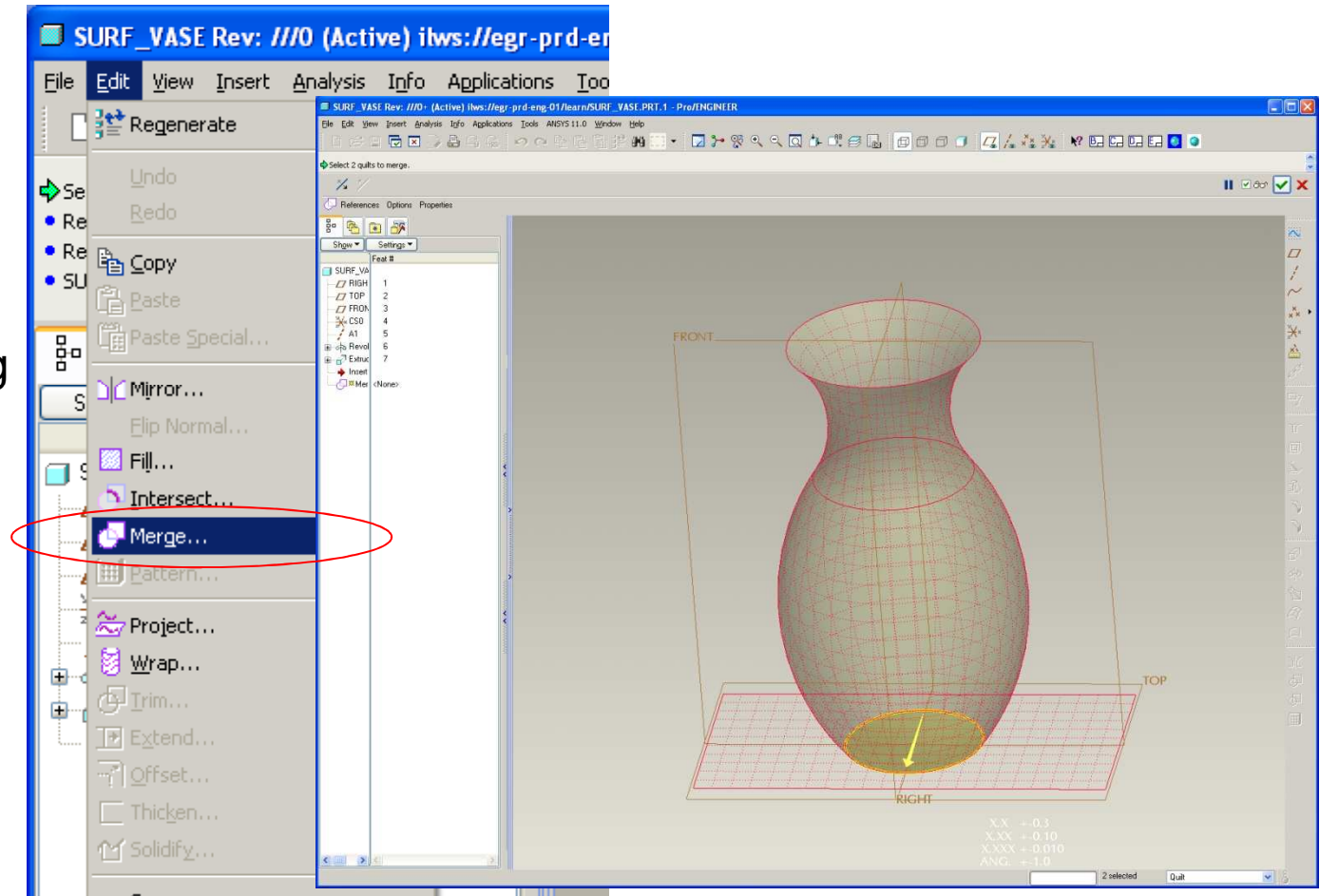
- Make sure the

Normals are pointing

in the correct

direction

- Click Done





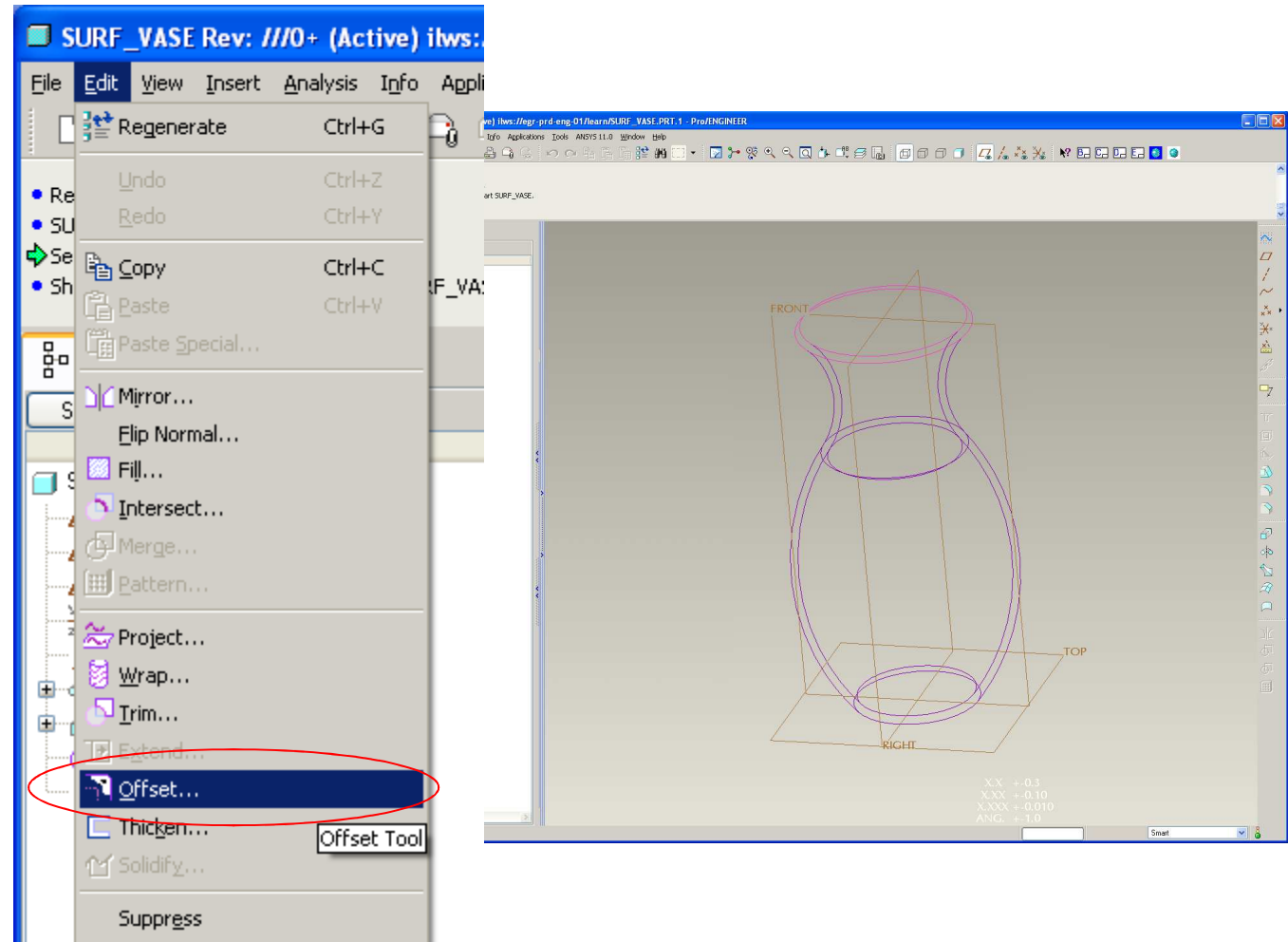
## EXERCISE – Vase from Surfaces

- Highlight the Merge in the Model Tree

- Edit > Offset

- Make sure the Normals are pointing in the correct direction

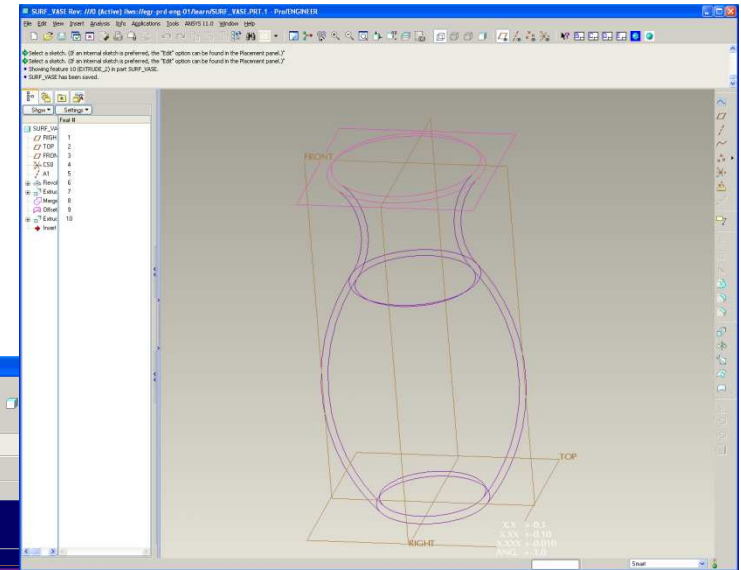
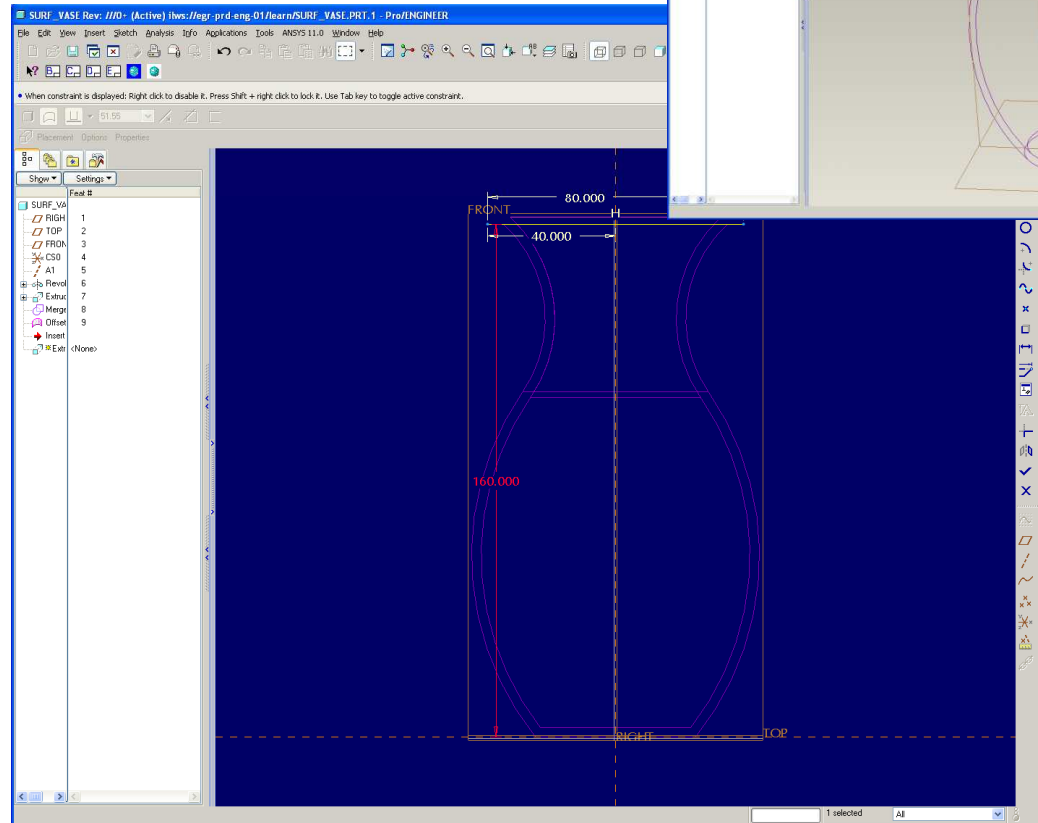
- Click Done





## EXERCISE – Vase from Surfaces

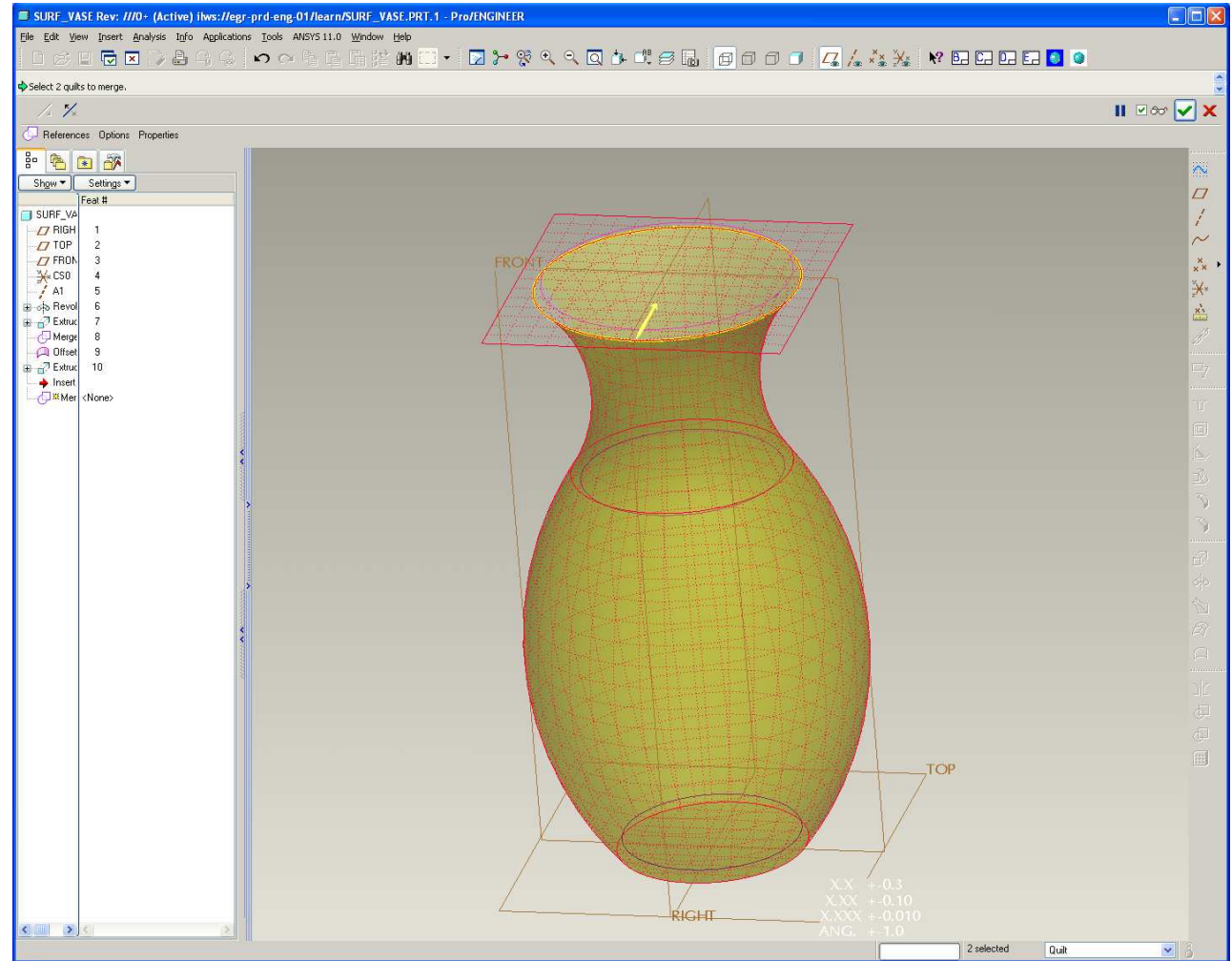
- Extrude an 80 X 80 surface 160 up from TOP datum
- Use Previous Sketch references





## EXERCISE – Vase from Surfaces

- Select the Merge and the latest Extrude in the Model tree
- Edit > Merge
- Toggle Surface Normal

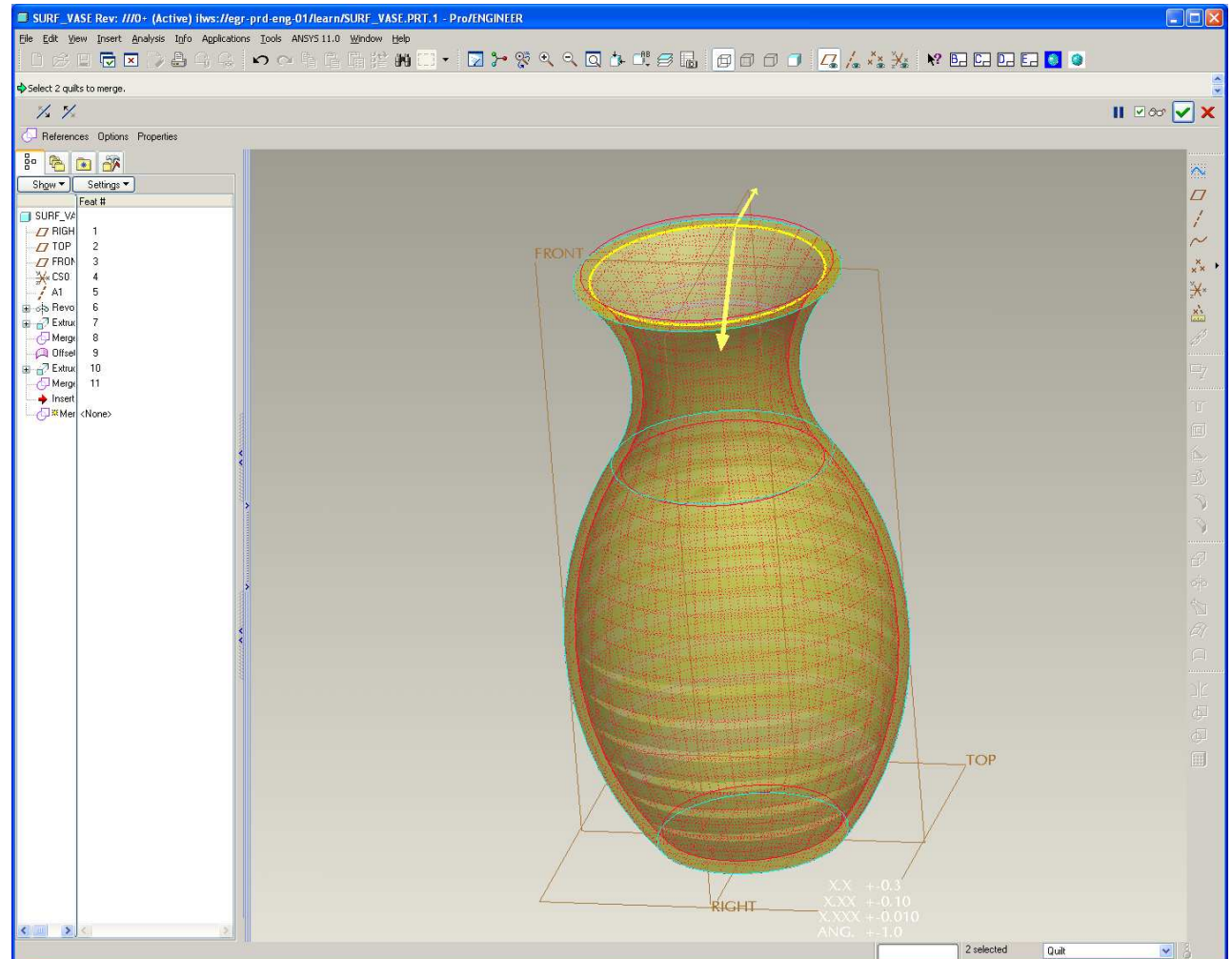






## EXERCISE – Vase from Surfaces

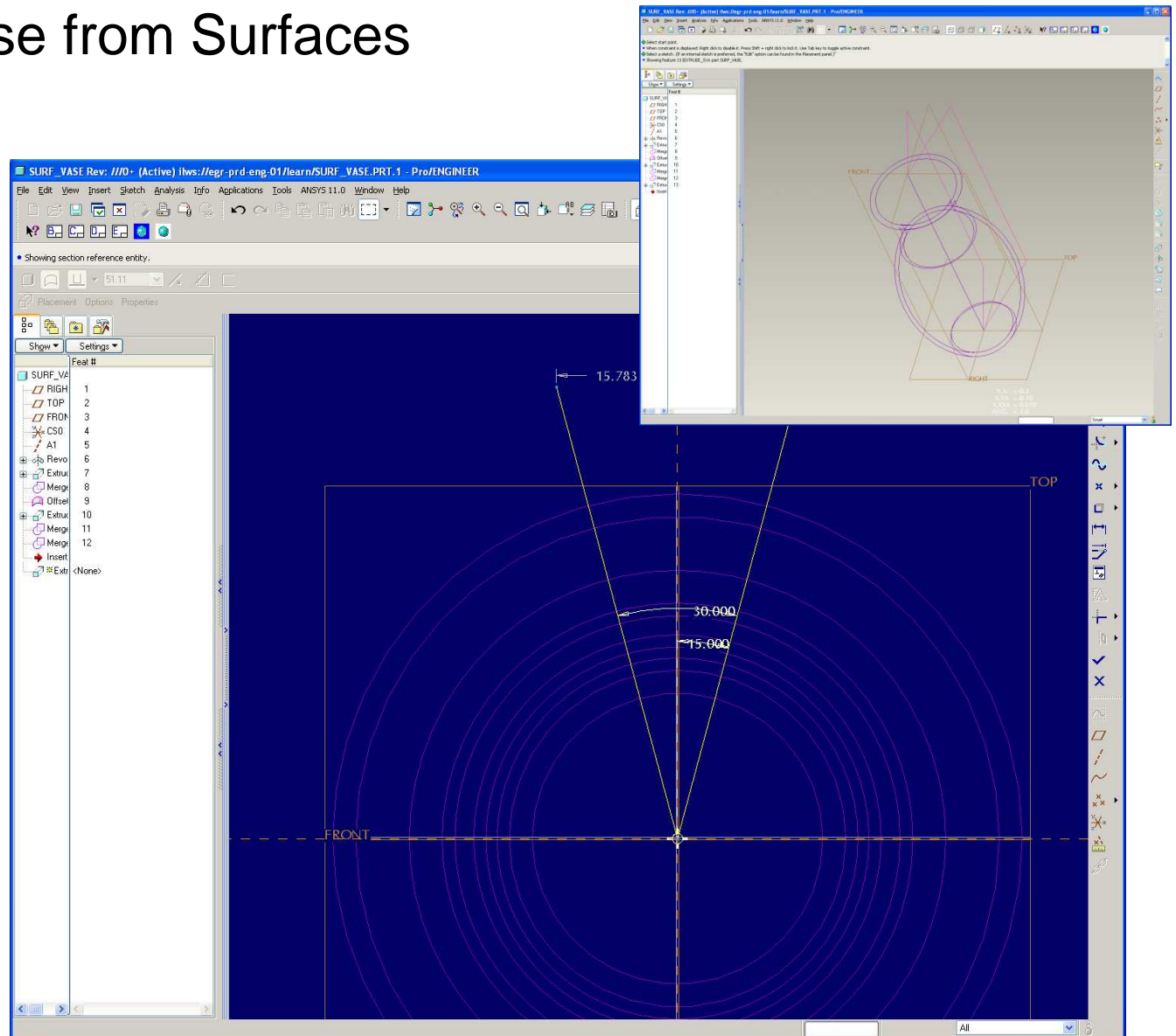
- Select the latest Merge and the Offset
- Edit > Merge
- Toggle Surface Normals





## EXERCISE – Vase from Surfaces

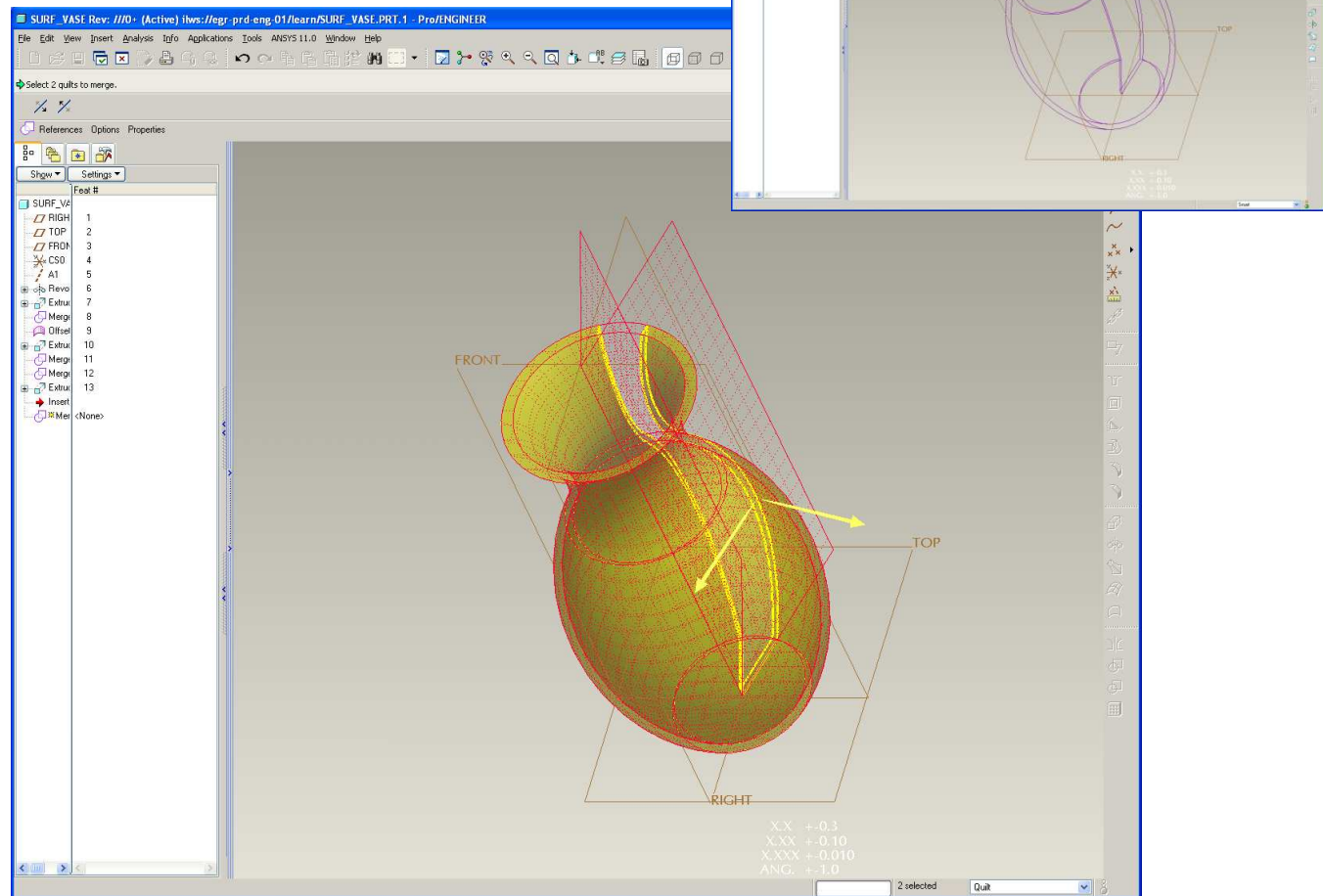
- Extrude an angled surface
- Sketch on Top datum
- Use RIGHT as Right datum
- Sketch a 30 degree section centered on RIGHT datum
- Extrude 180 high





## EXERCISE – Vase from Surfaces

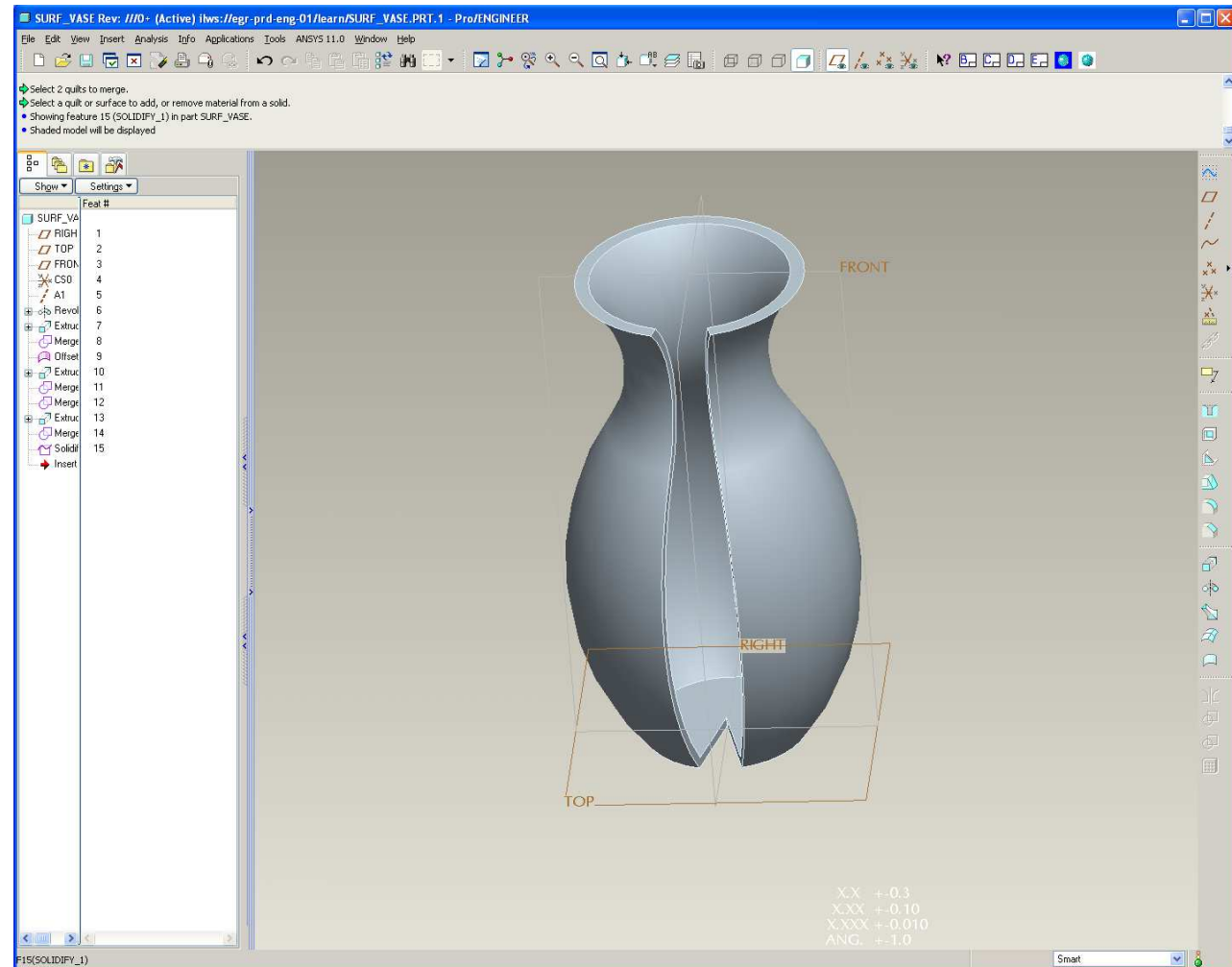
- Select the latest Merge and the latest Extrude
- Edit > Merge
- Toggle Surface Normals





## EXERCISE – Vase from Surfaces

- Select the last Merge
- Edit > Solidify







## Surfaces from Curves

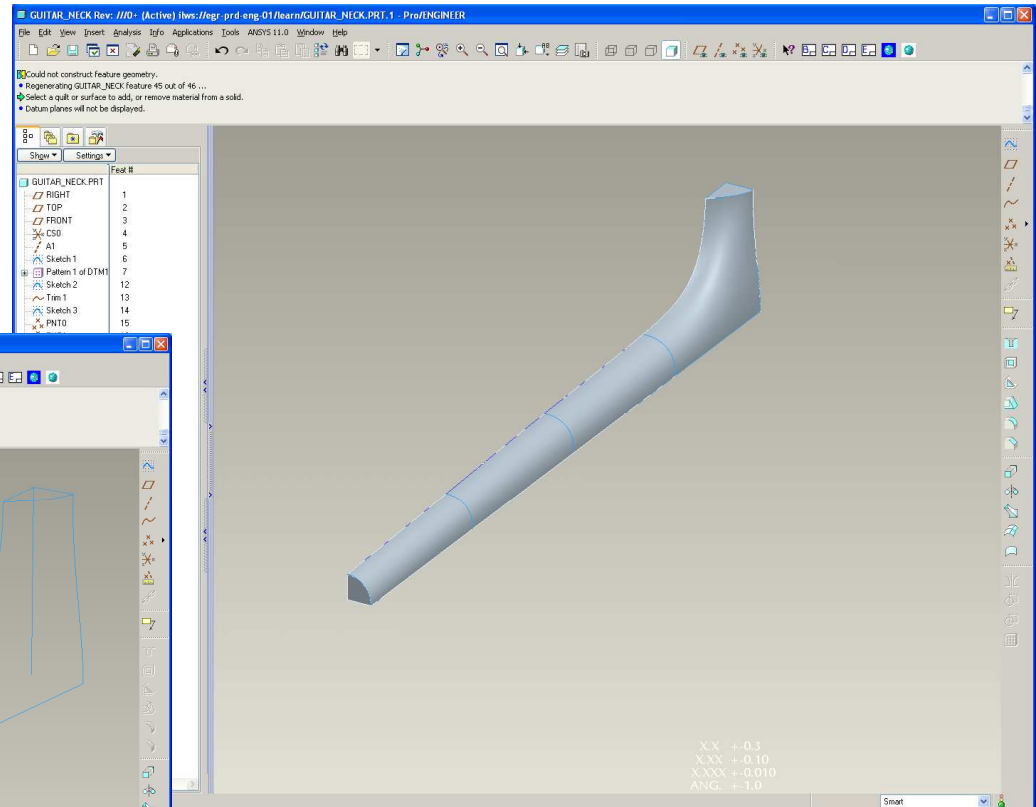
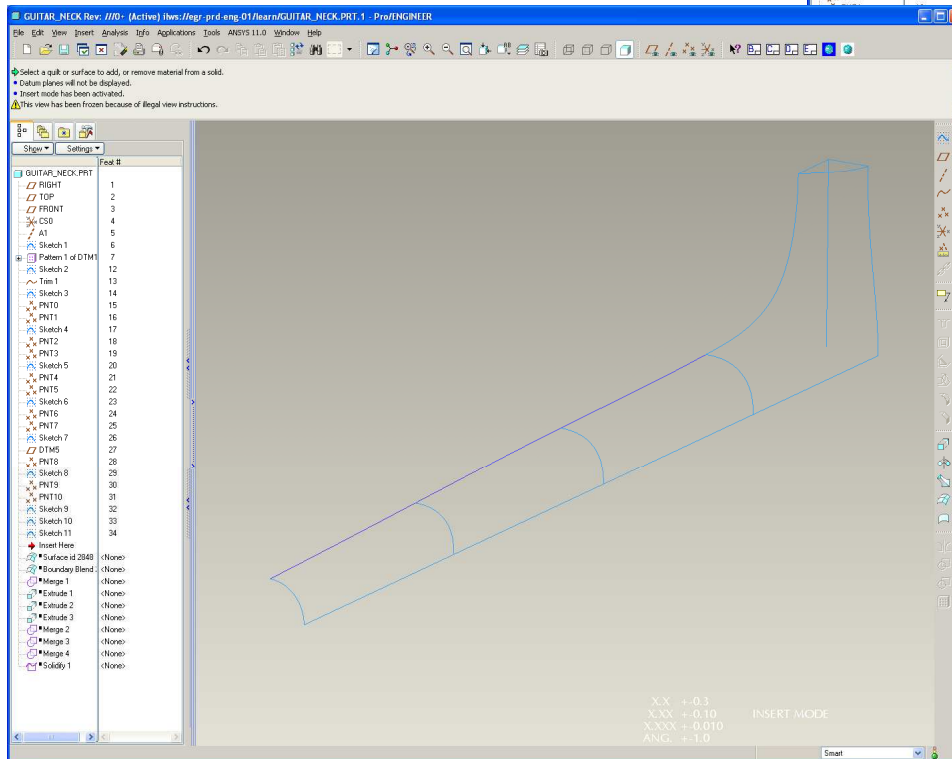
*Some surfaces are better to be defined  
by a series of boundary curves*





## Surfaces from Curves

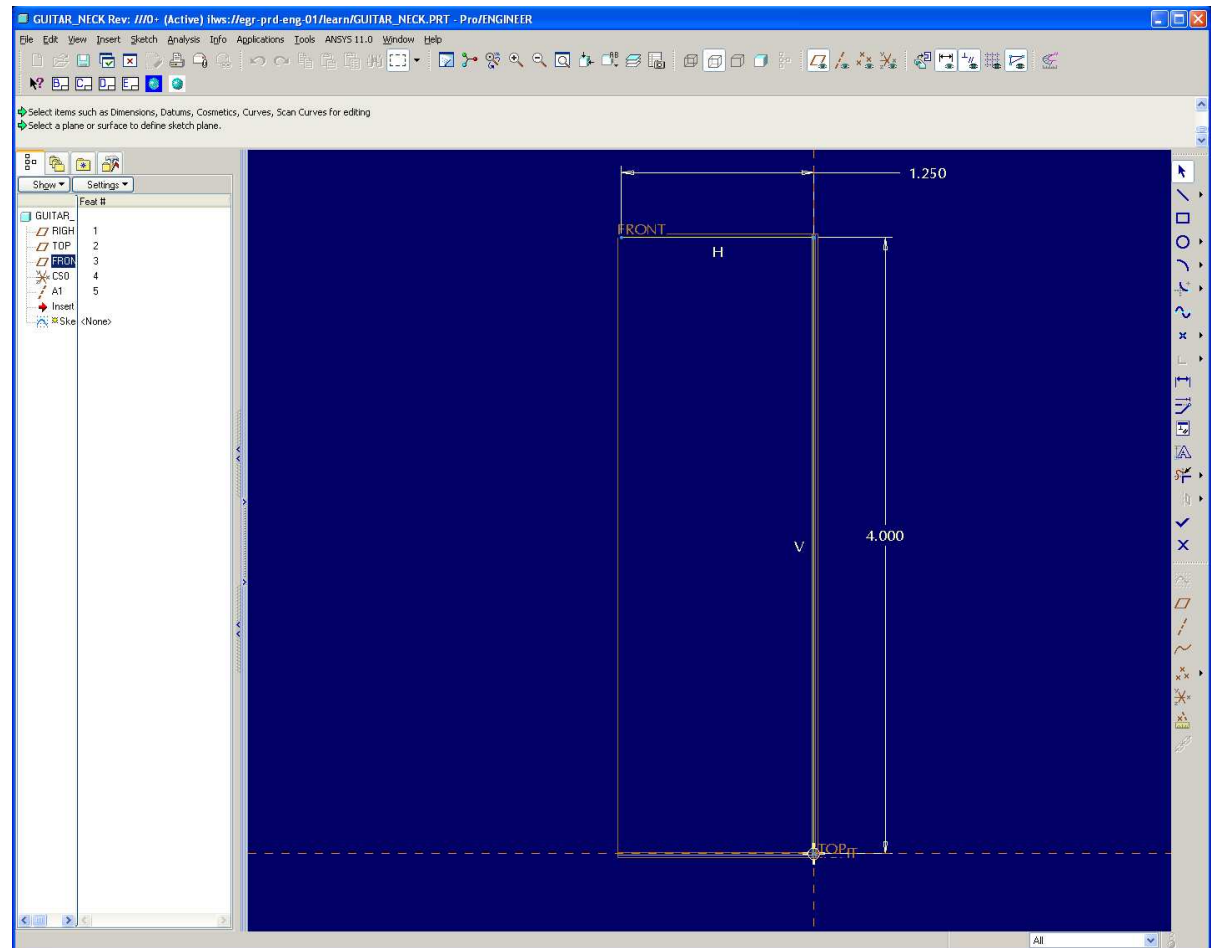
- Curves are sketched
- Surfaces are then connected between them





## EXERCISE - Surfaces from Curves

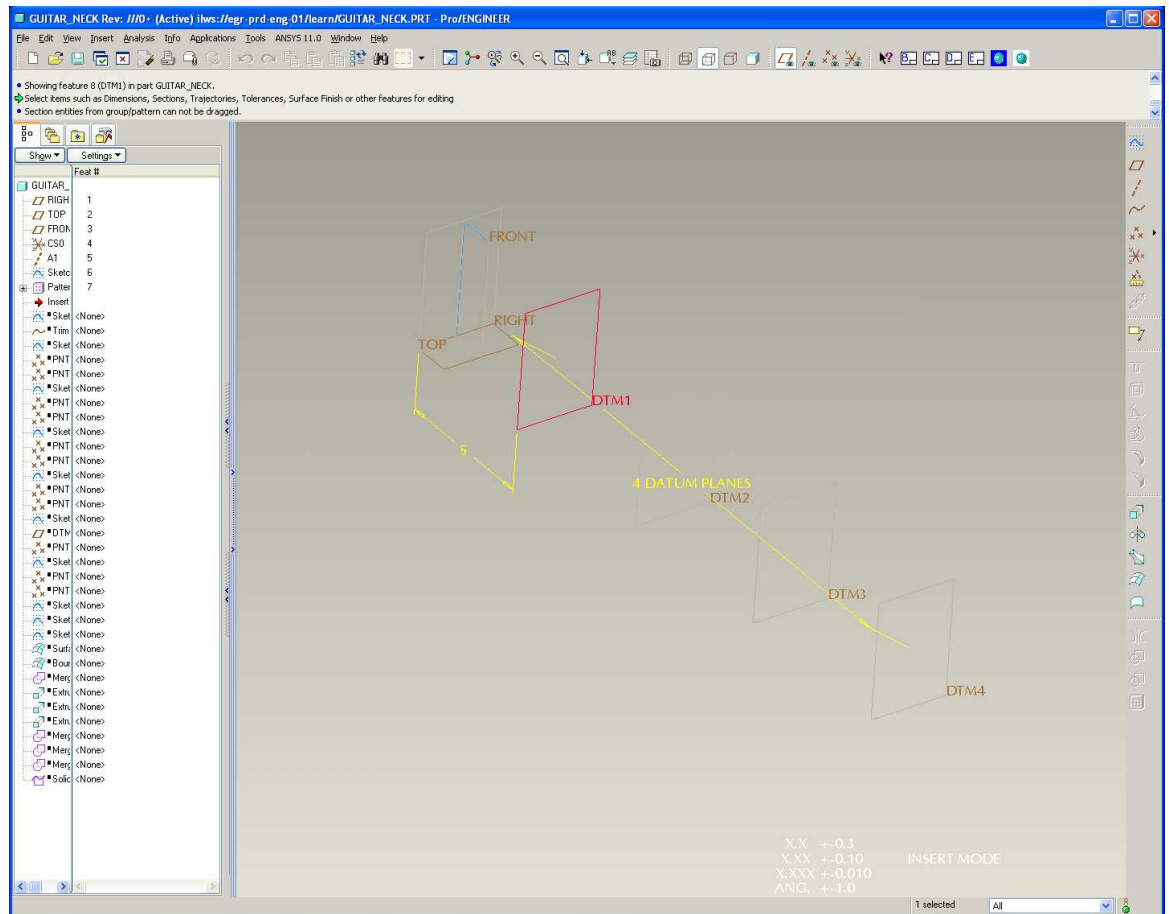
- Create a new part-file, guitar\_neck.prt
- Create a Sketch feature on the FRONT datum





## EXERCISE - Surfaces from Curves

- Create a Datum Plane  
offset from RIGHT datum by  
-5
- Pattern the new datum  
keeping the same spacing,  
create 4 total

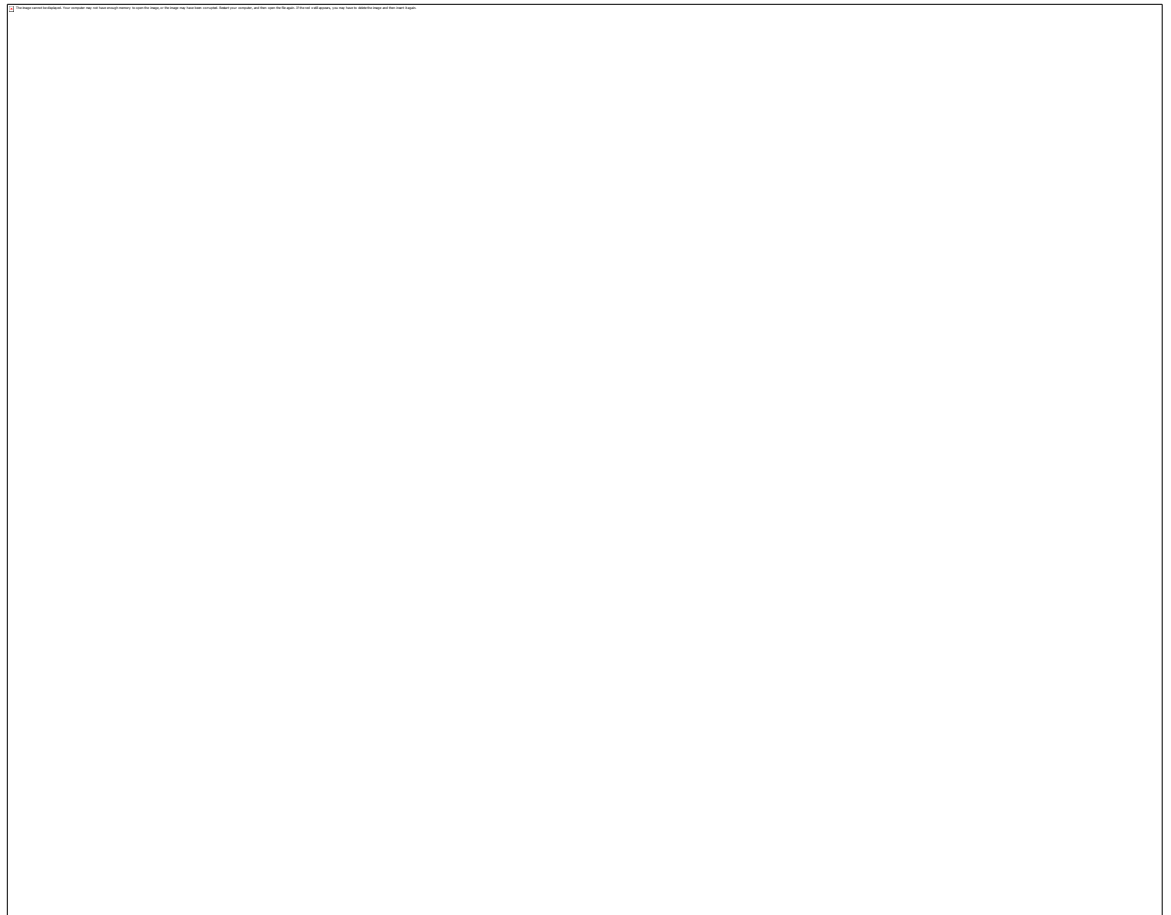






## *EXERCISE* - Surfaces from Curves

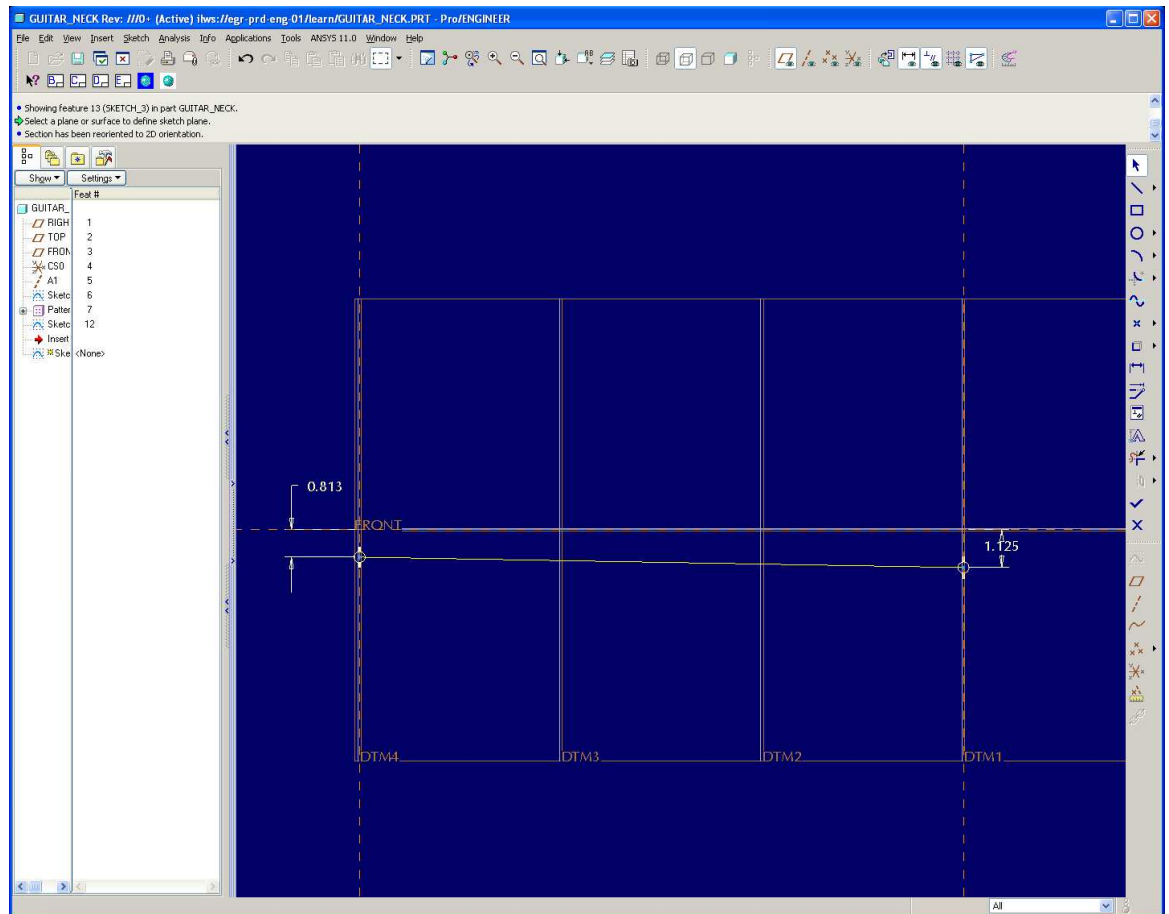
- Sketch a straight line curve on the FRONT datum, between the patterned datum
- Dimension the curve .85 up from the TOP datum on the left and 1.10 up on the right.





## EXERCISE - Surfaces from Curves

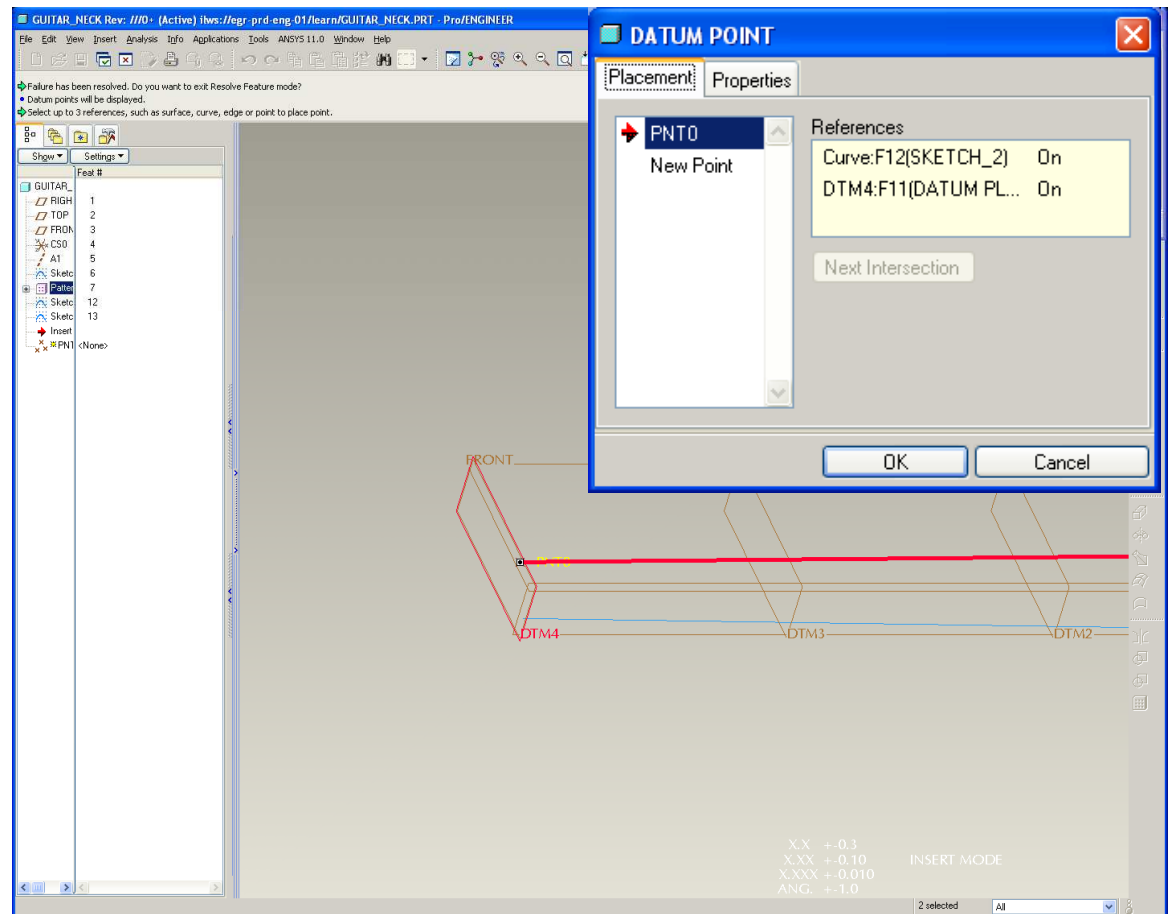
- Sketch a straight line curve on the TOP datum, between the patterned datum
- Dimension the curve .813 down from the FRONT datum on the left and 1.125 down on the right.





## EXERCISE - Surfaces from Curves

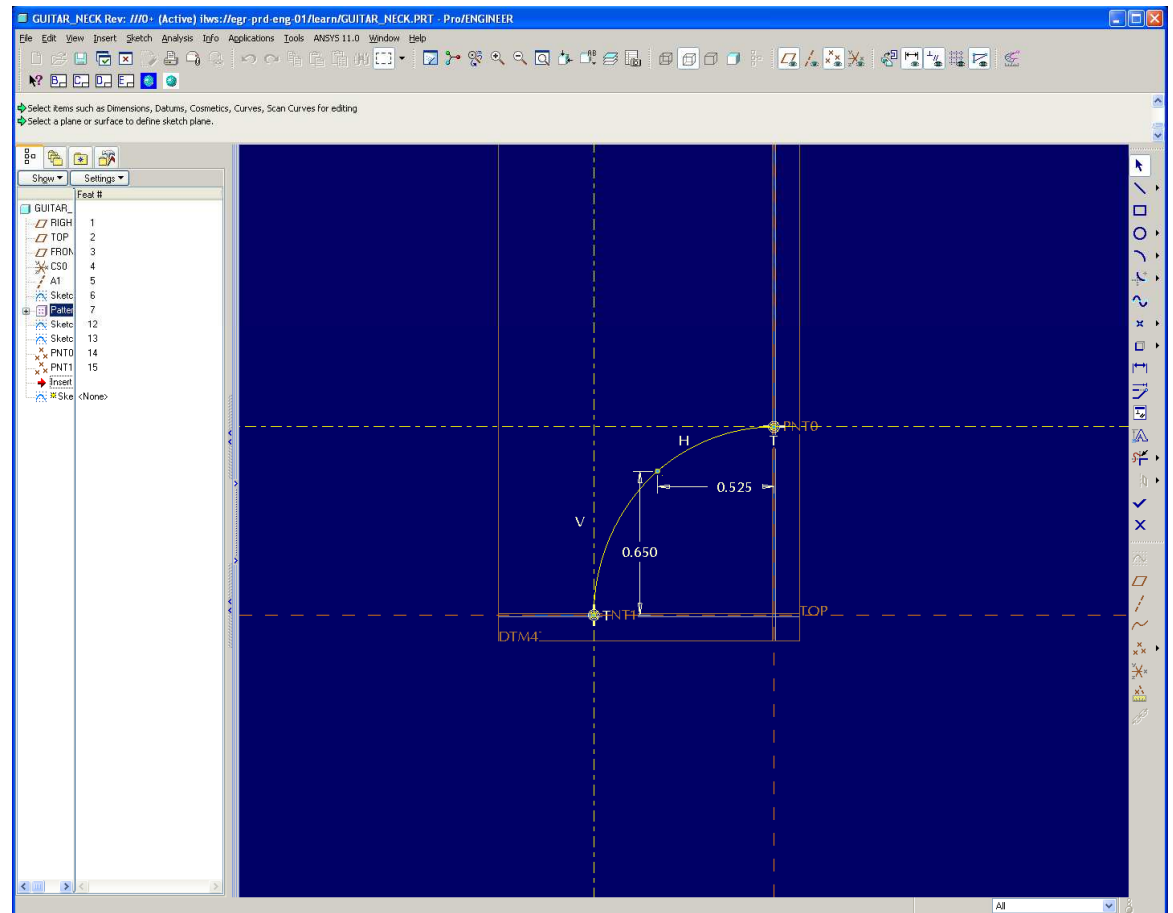
- Create a datum point at the intersection of the long curves and the last patterned datum plane.
- Create the point at the intersection of the curve and the plane





## EXERCISE - Surfaces from Curves

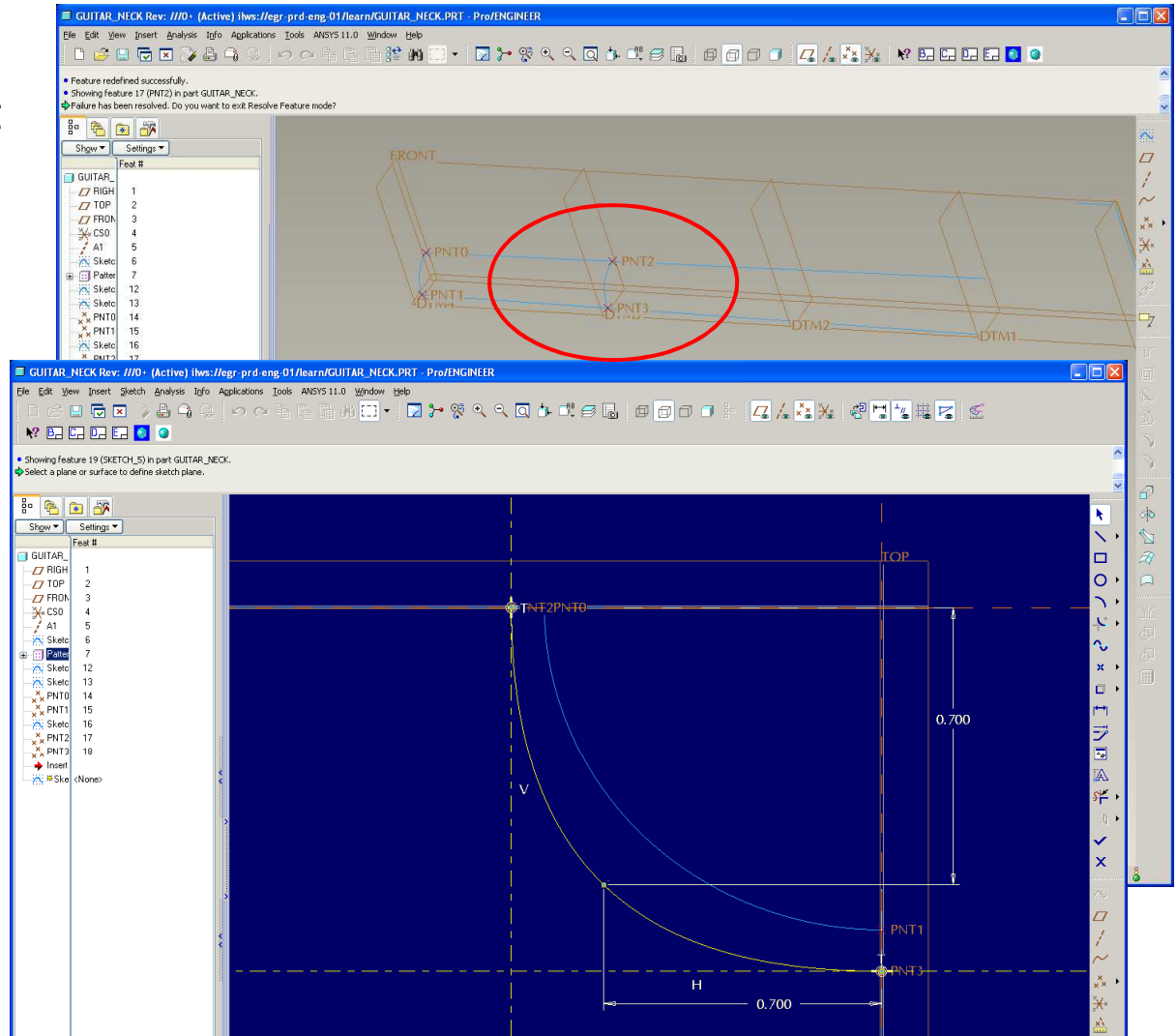
- Create this sketch on the plane where you've just created the points.
- Use a cubic spline with 3 points
- Establish centerlines through points
- Constrain ends tangent to center lines
- Dimension center point as shown





## EXERCISE - Surfaces from Curves

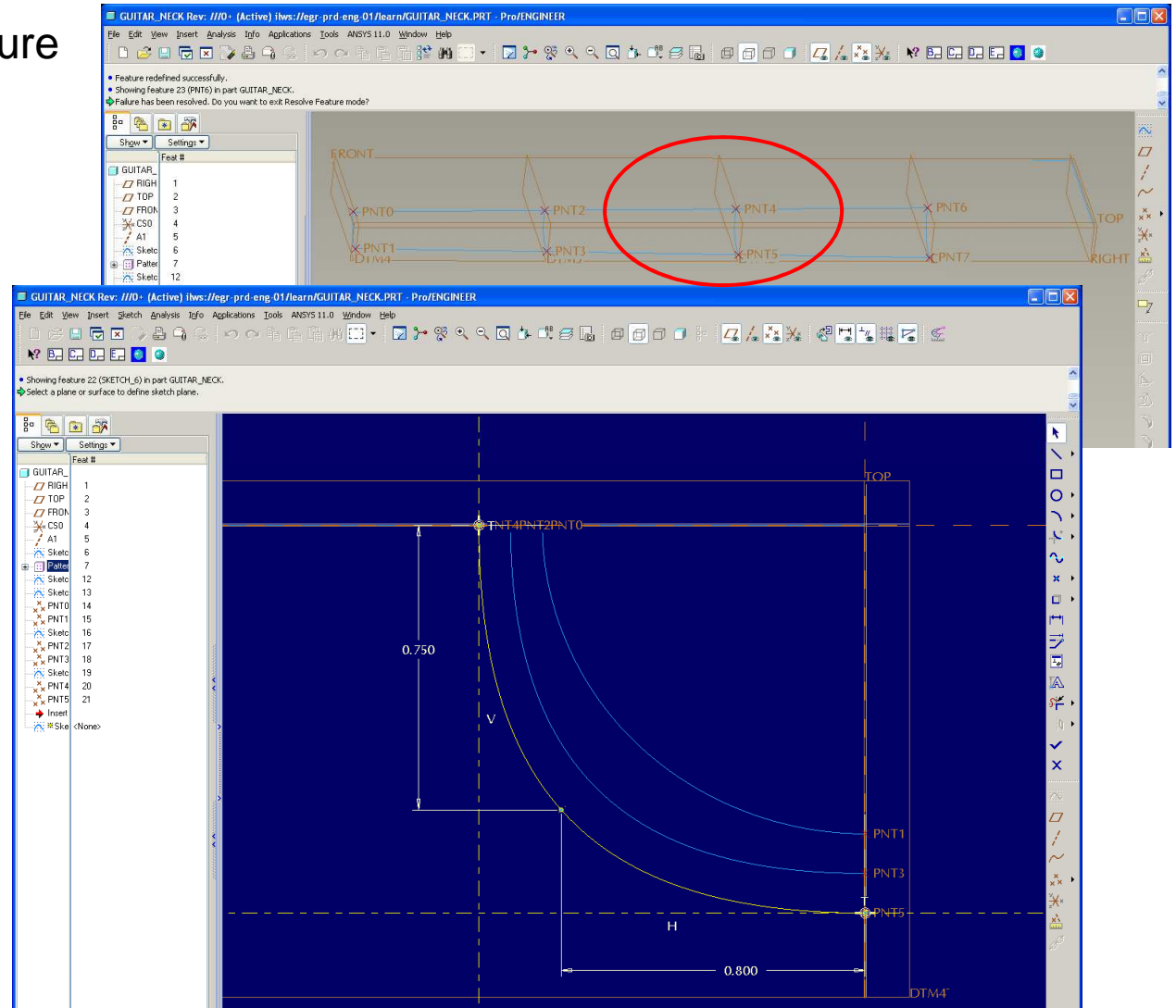
- Repeat the procedure on the last two slides on the next datum plane
- Sketch the curve shown below





## EXERCISE - Surfaces from Curves

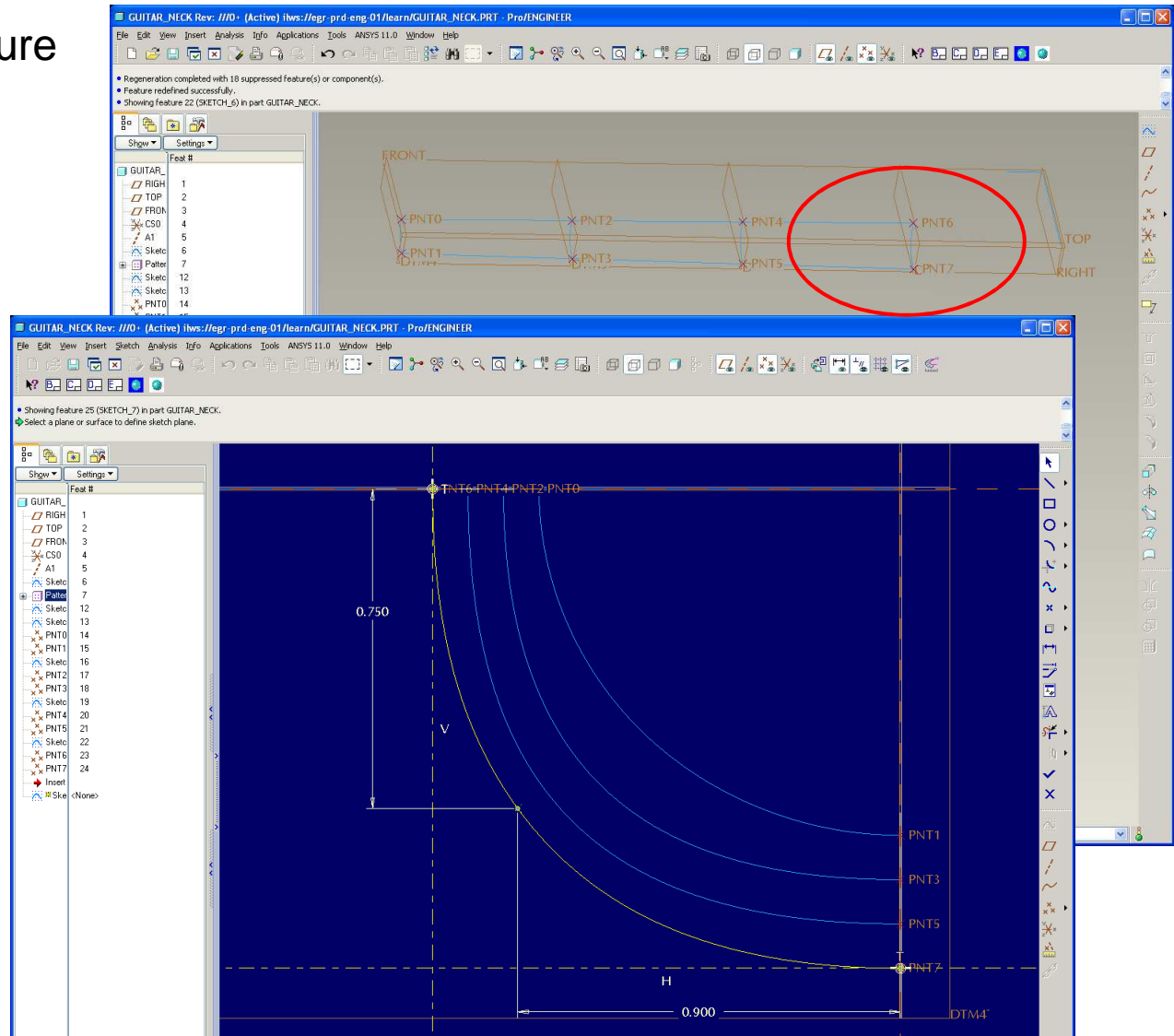
- Repeat the same procedure on the next datum plane
- Sketch the curve shown below





## EXERCISE - Surfaces from Curves

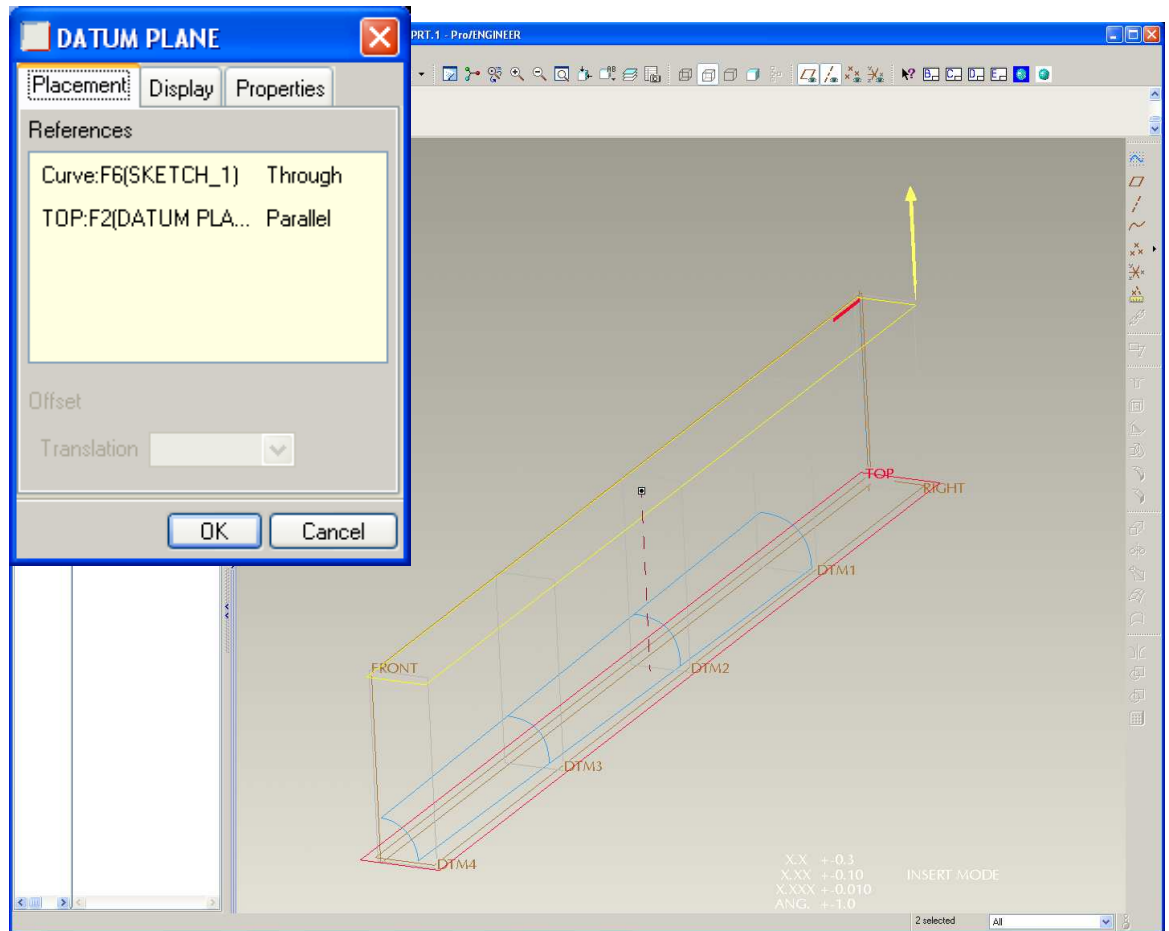
- Repeat the same procedure on the next datum plane
- Sketch the curve shown below





## EXERCISE - Surfaces from Curves

- Create a datum plane parallel from the TOP datum and through the top entity of the first curve

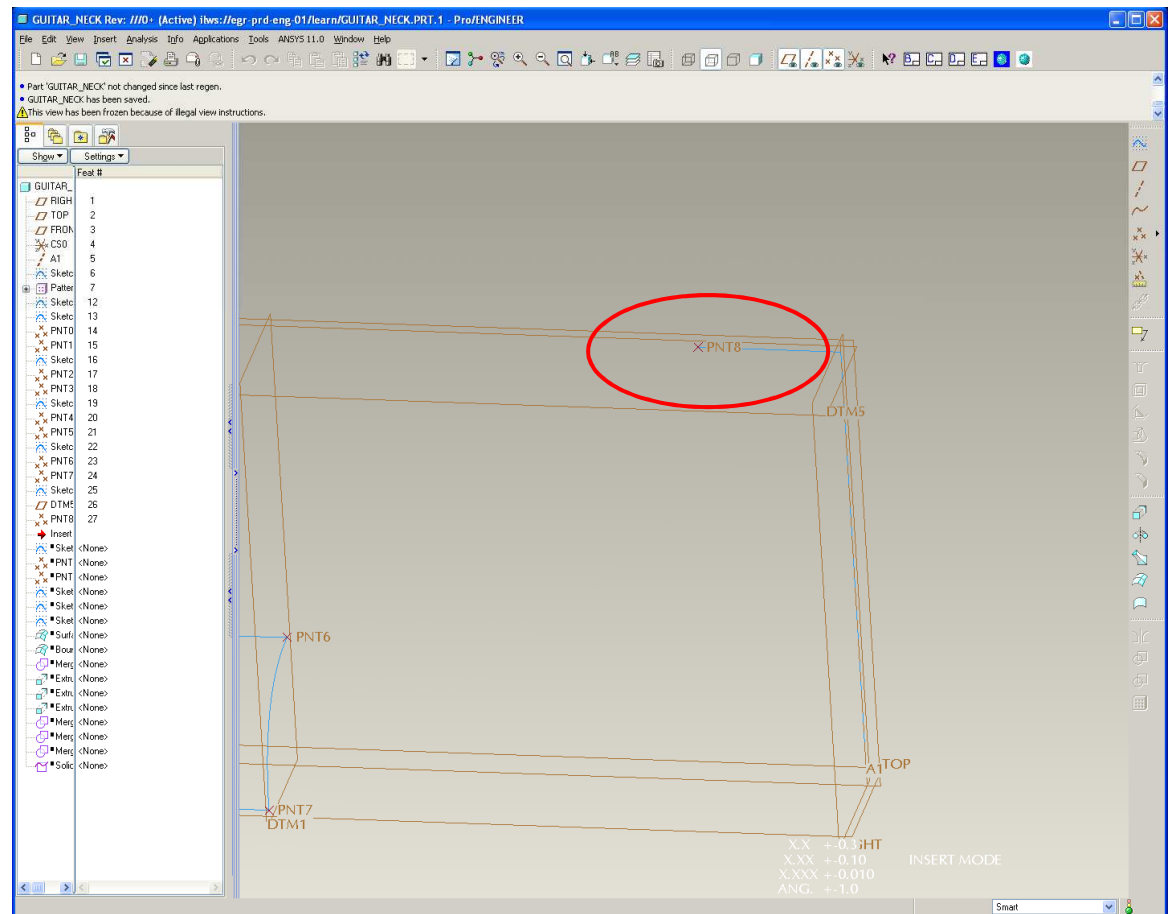






## EXERCISE - Surfaces from Curves

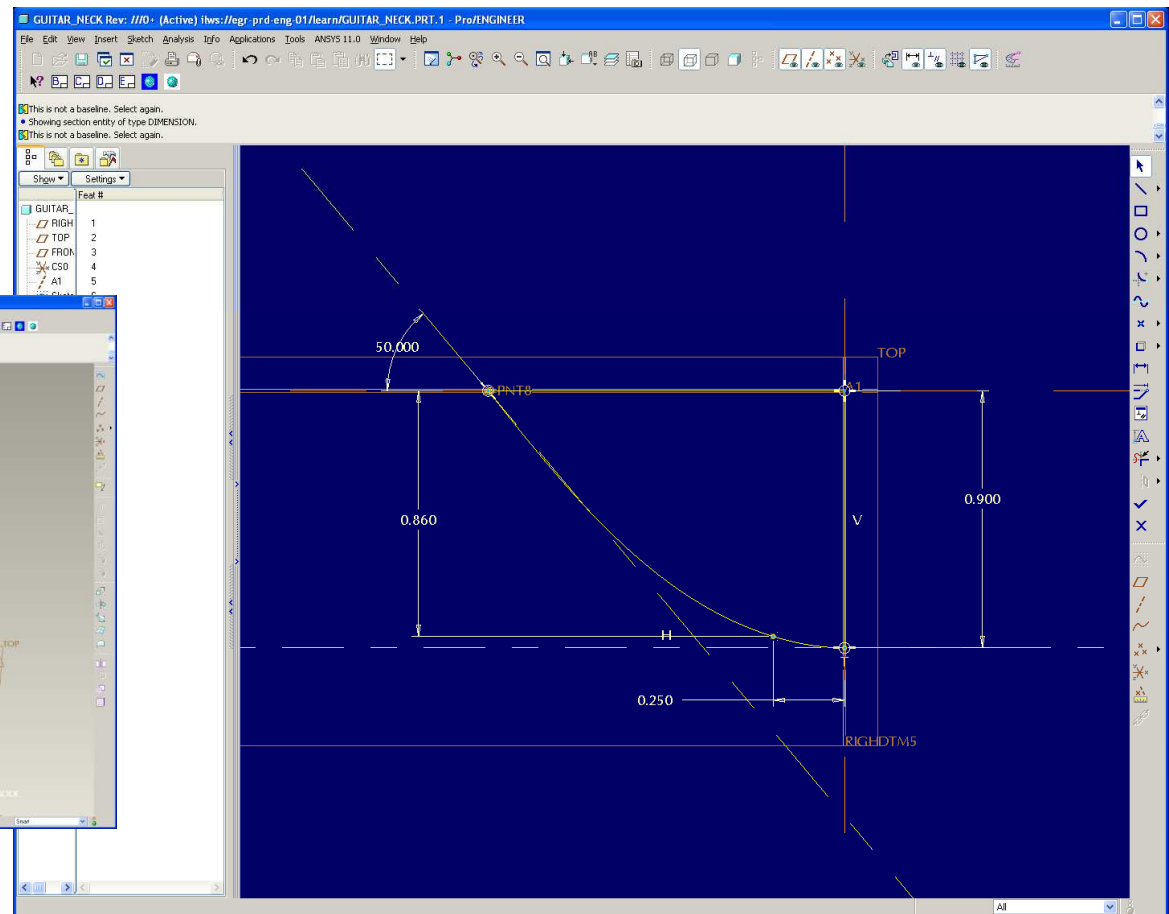
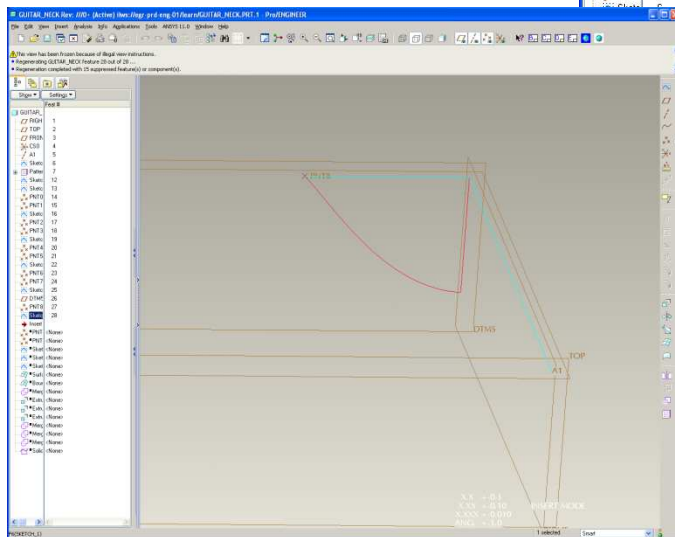
- Put a datum point on the end of the curve entity as shown below





## EXERCISE - Surfaces from Curves

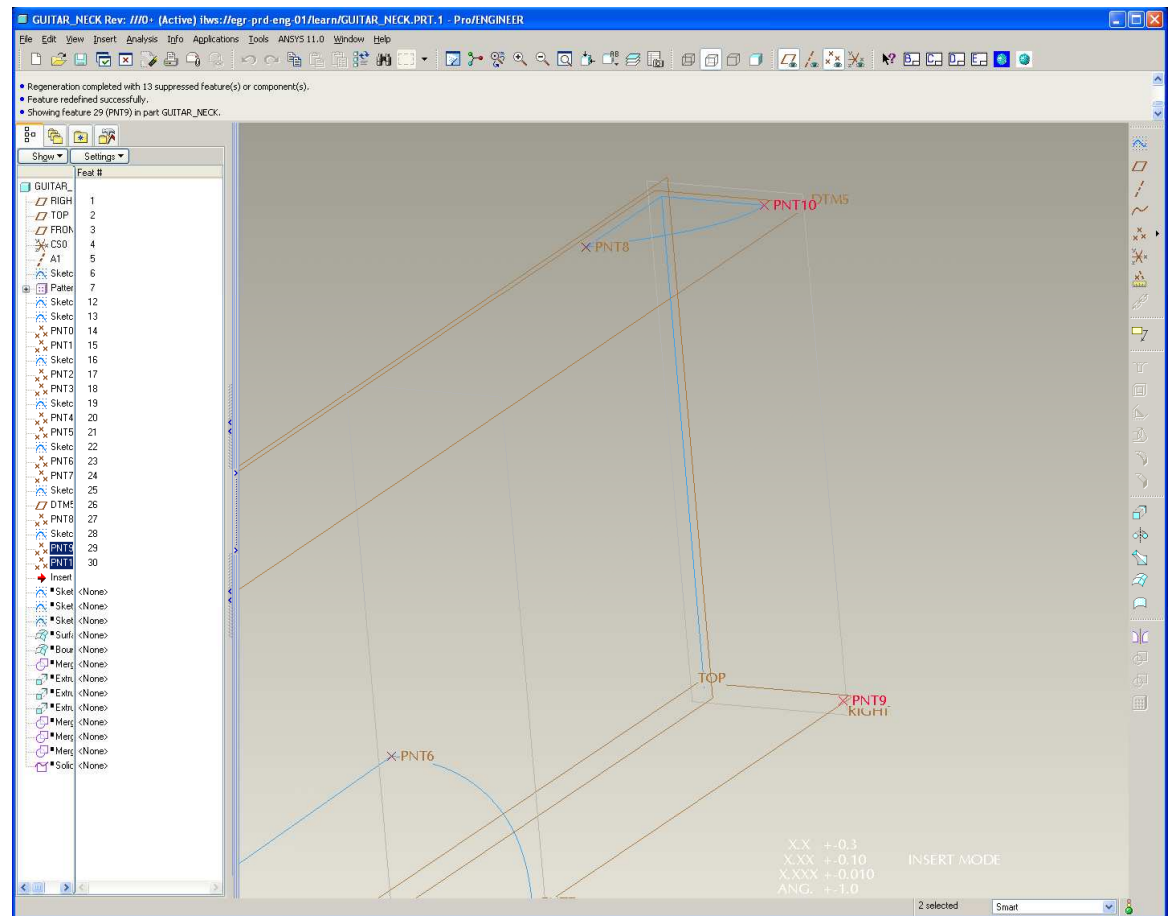
- Create the sketch as shown below on DTM5 (or as created the slide before last)





## EXERCISE - Surfaces from Curves

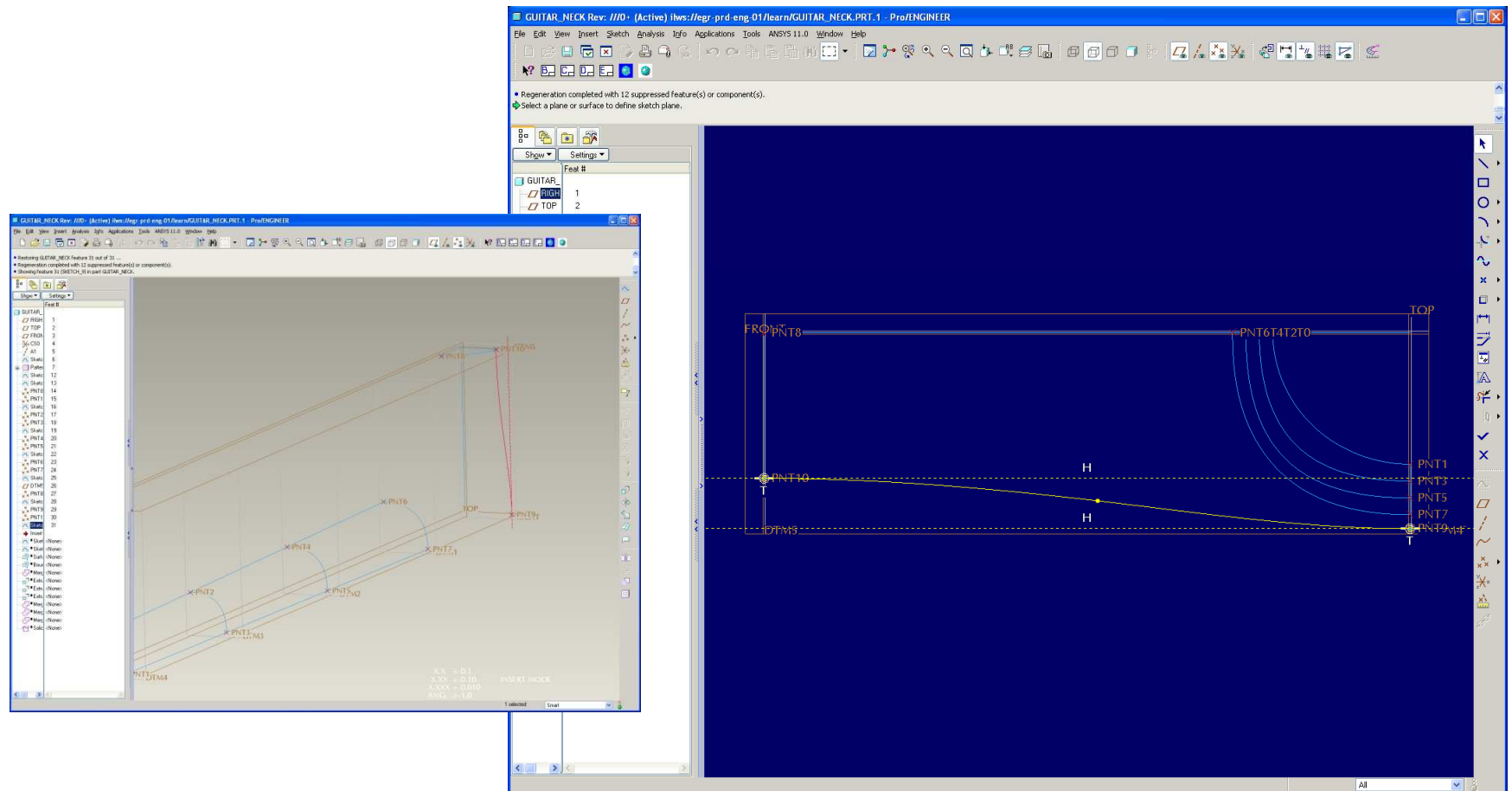
- Create the two points as shown below
- For PNT9 as shown, use the RIGHT datum and the projection of the side Sketch





## EXERCISE - Surfaces from Curves

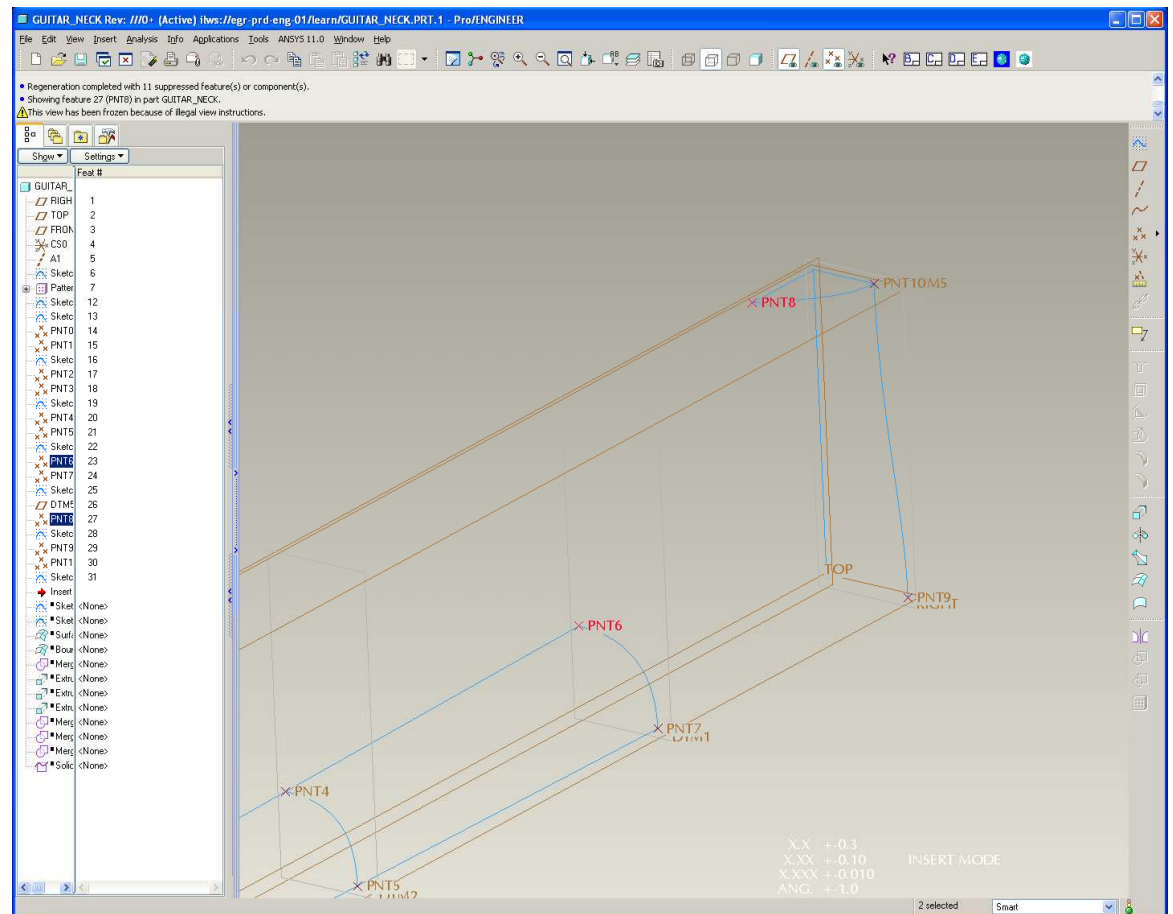
- Create the following Sketch on the RIGHT datum





## EXERCISE - Surfaces from Curves

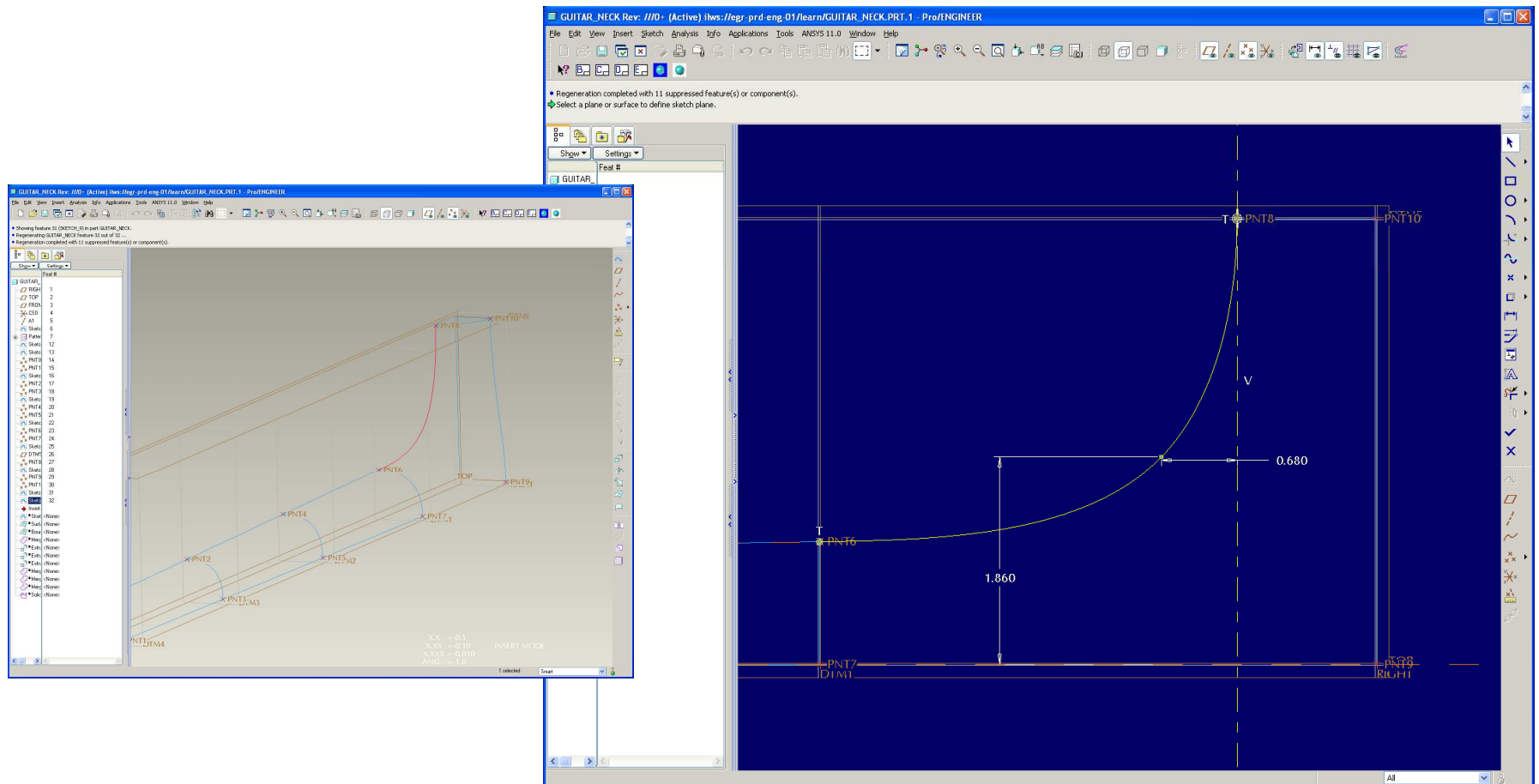
- Create the datum points shown below
- shown below





## EXERCISE - Surfaces from Curves

- Create the following Sketch on the FRONT datum



## EXERCISE - Surfaces from Curves

- Create the following Sketch on the TOP datum

