Chapter 4 Fuselage and Sharks Tooth

A. Save as "FUSELAGE".

Step 1. Open your **FUSELAGE BLANK** file.

Step 2. Click File Menu > Save As.

Step 3. Key-in **FUSELAGE** for the filename and press ENTER.

B. Sketch Fuselage.

Step 1. Click the **left side face** of the Fuselage Blank and click **Sketch** on the Content menu, **Fig. 1**.

Step 2. Click **Normal To** on the Standard Views toolbar. (**Ctrl-8**)

Step 3. Zoom in around **front of the Fuselage**, **Fig. 2**. To **zoom**, hold down **Shift key** and drag with middle mouse button (wheel). To **pan**, hold down **Ctrl key** and drag with middle mouse button (wheel).

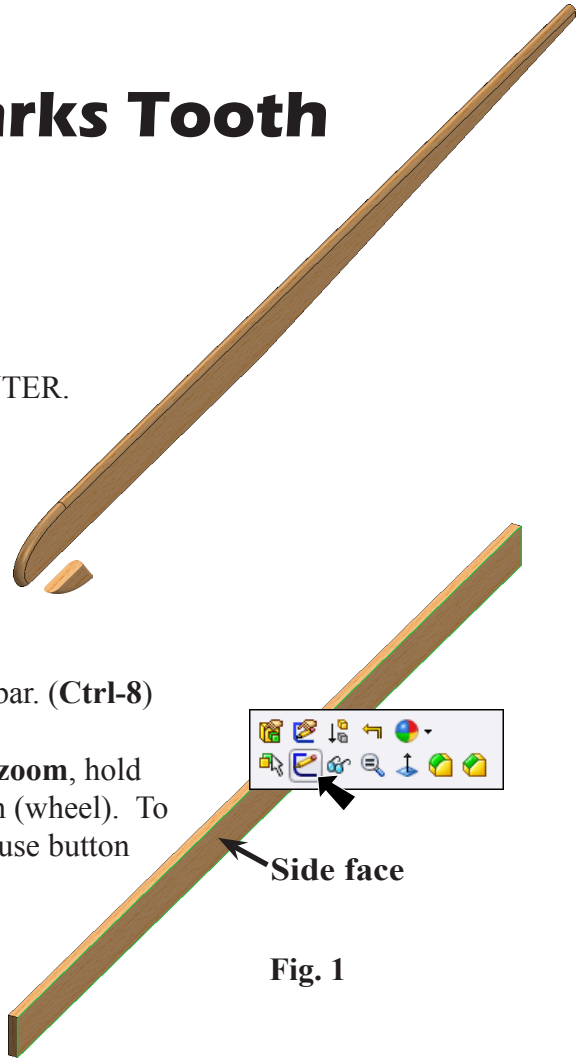

Fig. 1

C. 2 Point Spline.

Step 1. Click **Spline** (**S**) on the Sketch toolbar.

Step 2. Draw a **2 Point Spline** on the edges of the Fuselage Blank, **Fig. 3**. Press Escape to end spline.

Step 3. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 4. Add the Dimensions as shown in **Fig. 4**.

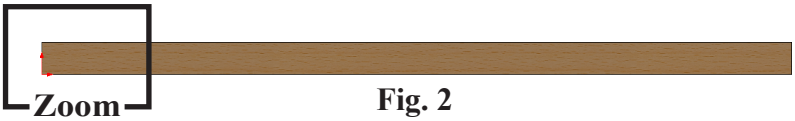

Fig. 2

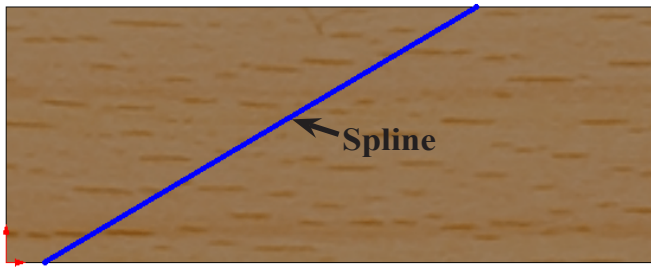

Fig. 3

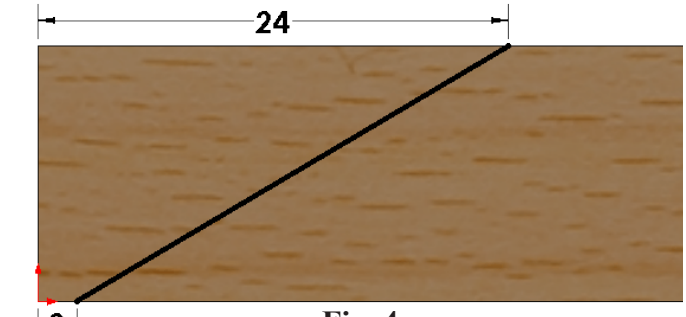

Fig. 4

Step 5. **Right click drawing and click Select** from menu to unselect Smart Dimension.

Step 6. Click spline to select it. Grab **Circular Spline handle** (small gray dot) of **Spline Point 1** and pull handle out to left, **Fig. 5** and **Fig. 6**. To find the Circular spline handle, start your cursor at the bottom Spline Point, Spline Point 1 and move cursor up along the spline. Circular Spline handle will highlight as a red circle .

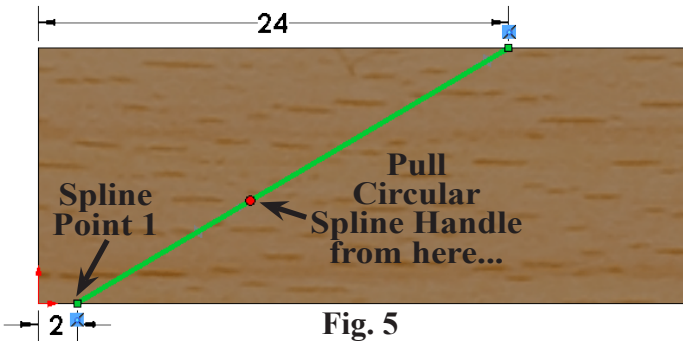

Fig. 5

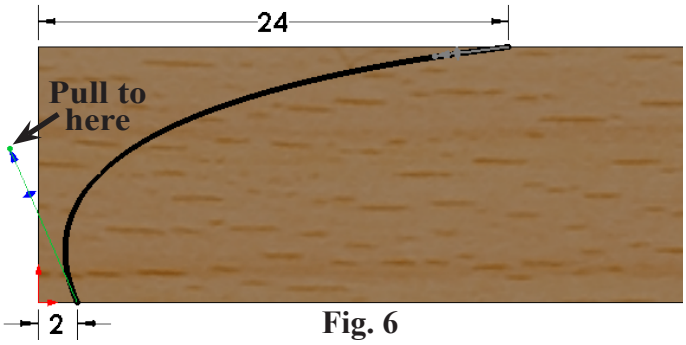

Fig. 6

Step 7. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 8. Dimension Spline Point 1 **Tangent Weighting2 18**, **Fig. 7**. To dimension Tangent Weighting, click the **Circular Spline handle** , then move the cursor out away from spline and click. Key-in 18 and press ENTER.

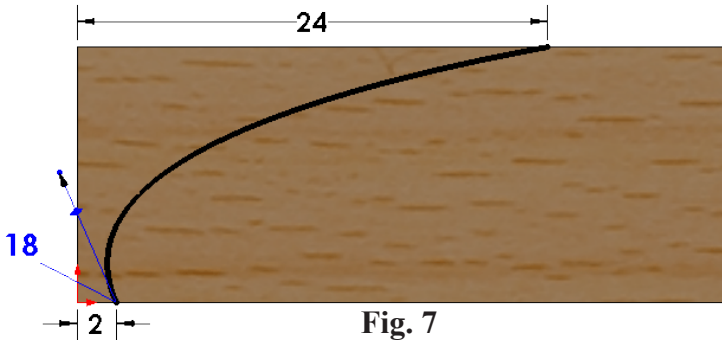

Fig. 7

Step 9. Dimension Spline Point 1 **Tangent Radial Direction 46 degrees**, **Fig. 8**. To dimension Tangent Radial Direction, click the **Circular Spline handle and front edge of Fuselage Blank**, then move cursor between and click. Key-in 46 and press ENTER.

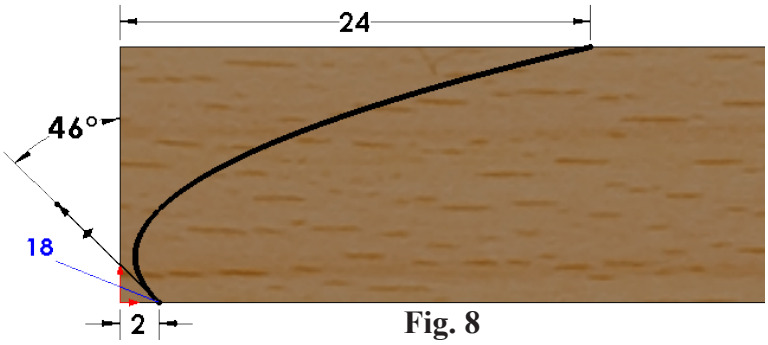

Fig. 8

Step 10. Click Spline to display the Circular Spline handle, **Fig. 9**.

Step 11. Dimension Spline Point 2 **Tangent Weighting1 74**, **Fig. 10**. To dimension Tangent Weighting, click the **Circular Spline handle**, then move the cursor out away from spline and click. Key-in 74 and press ENTER.

Step 12. **Right click drawing and click Select** from menu to unselect Smart Dimension.

Step 13. **Ctrl click** the **Circular Spline handle** **of Spline Point 2 and the top edge of Fuselage Blank** to select both, **Fig. 11**.

Click **Make Collinear** on the Property Manager, **Fig. 12** and **Fig. 13**.

Step 14. Save. Use **Ctrl-S**.

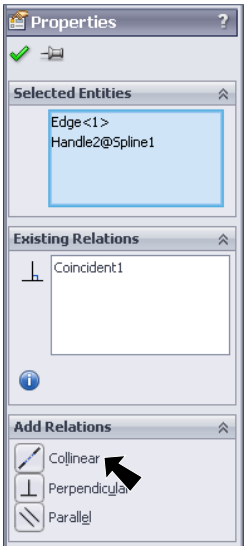

Fig. 12

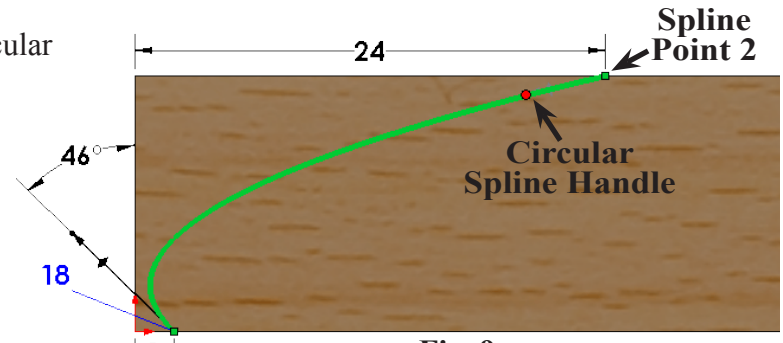

Fig. 9

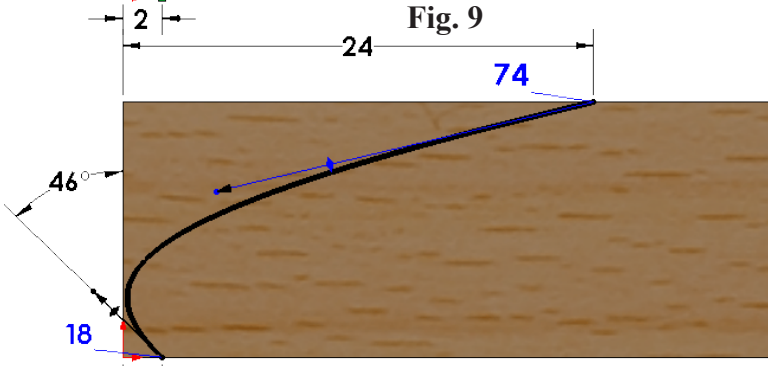

Fig. 10

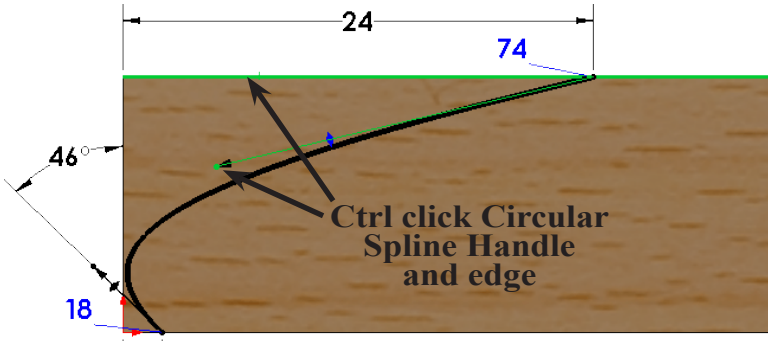

Fig. 11

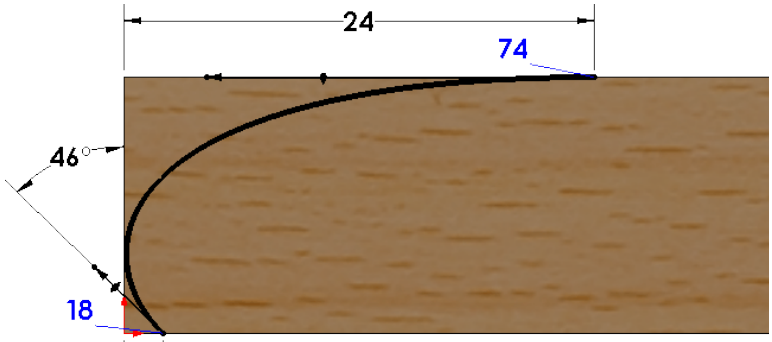

Fig. 13

D. Lines.

Step 1. Click **Line** (**L**) on the Sketch toolbar.

Step 2. Draw a **line part way across bottom edge of Blank and line up at angle to rear edge**, **Fig. 14 and Fig. 15**. To draw the lines, first click bottom endpoint of Spline to start line. Use **F key** to zoom out and continue the lines. Keep line endpoint on rear edge away from Midpoint.

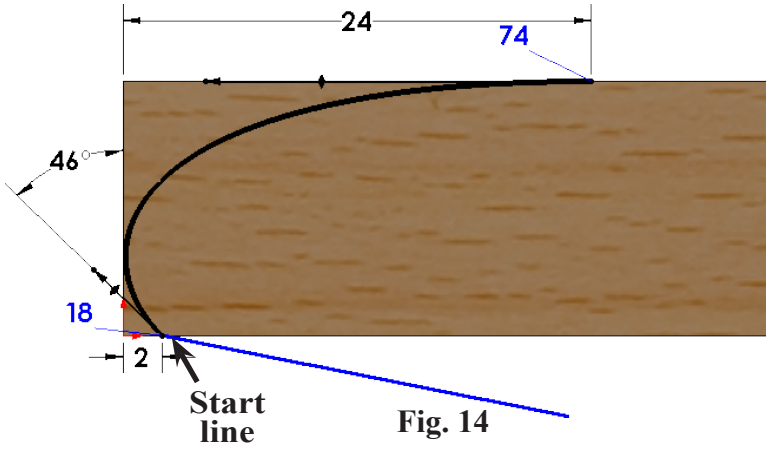

Fig. 14

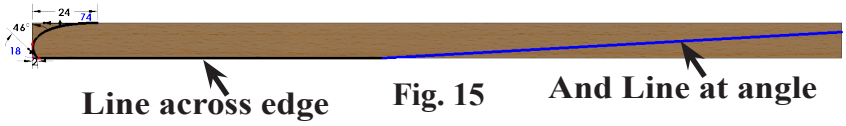

Fig. 15

Fig. 16

Step 3. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 4. Add the Dimensions as shown in **Fig. 16**.

Step 5. Save. Use **Ctrl-S**.

Fig. 17

E. Lines - Tooth.

Step 1. Zoom in around **rear of the Fuselage**, **Fig. 17**. To **zoom**, hold down **Shift key** and drag with middle mouse button (wheel). To **pan**, hold down **Ctrl key** and drag with middle mouse button (wheel).

Step 2. Click **Line** (**L**) on the Sketch toolbar.

Step 3. Draw the **2 lines** shown in **Fig. 18**.

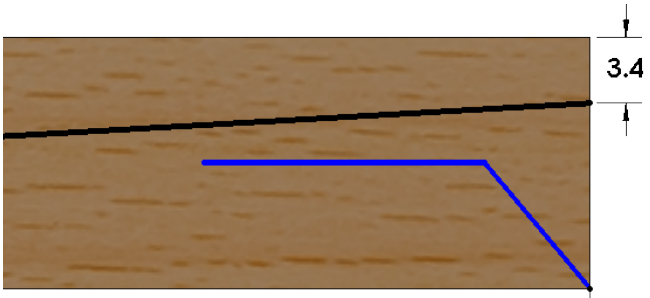

Fig. 18

Step 4. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 5. Add the Dimensions as shown in **Fig. 19**. **To Smart dimension angle**, click line at angle and bottom edge of Fuselage Bank, then move the cursor between and click. Key-in **50** for the dimension and press ENTER.

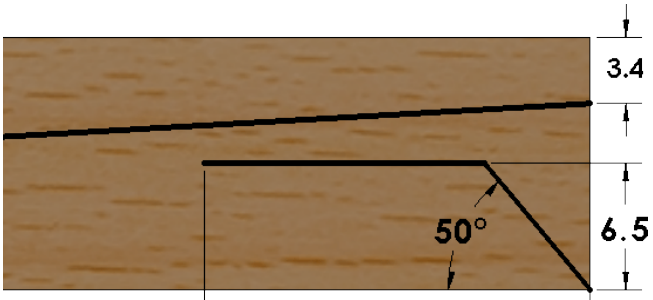

Fig. 19

F. 3 Point Arc.

Step 1. Click **3 Point Arc** (S) in the **Arc flyout** on the Sketch toolbar.

Step 2. Draw an arc across as shown, **Fig. 20**. To draw arc, click Point 1 for start point and Point 2 for ending point, then Point 3 for third point.

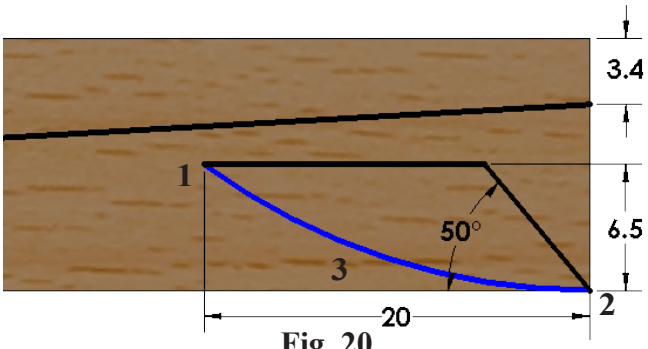

Fig. 20

Step 3. Click **Smart Dimension** (S) on the Sketch toolbar.

Step 4. Dimension arc radius **34**, **Fig. 21**.

Step 5. Save. Use **Ctrl-S**.

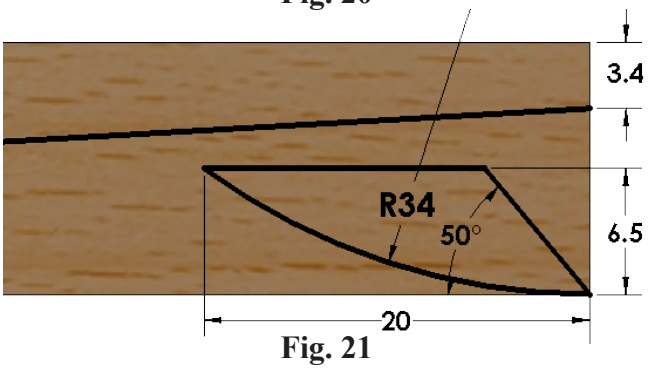

Fig. 21

G. Extruded Cut FUSELAGE.

Step 1. Click Zoom to Fit (F) on the View toolbar.

Step 2. Click **Features** on the Command Manager toolbar.

Step 3. Click **Extruded Cut** on the Features toolbar.

Step 4. In the Cut-Extrude Property Manager set:

under Direction1, **Fig. 22**

End Condition **Through All**

check **Flip side to cut**

under Selected Contours

click **Fuselage shaped contour** in graphics area, **Fig. 23**.

The Direction arrow should point towards area to be cut away, **Fig. 23.** If arrow is pointing in wrong direction, uncheck **Flip side to cut, Fig. 22**.

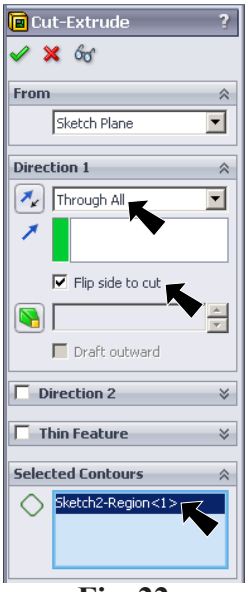

Fig. 22

click OK .

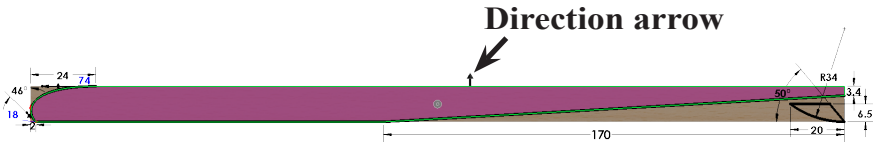

Fig. 23


Fig. 24

H. Fillet Full Round.

Step 1. Click **Trimetric** on the Standard Views toolbar.

Step 2. Zoom in around **front of the Fuselage**, **Fig. 25**. To **zoom**, hold down **Shift key** and drag with middle mouse button (wheel). To **pan**, hold down **Ctrl key** and drag with middle mouse button (wheel).

Step 3. Click **Fillet** on the Features toolbar.

Step 4. In the Fillet Property Manager set:
select **Manual**, **Fig. 26**
under **Fillet Type**
select **Full round fillet**

click in the **Face Set 1** box
click **left side face of fuselage**, **Fig. 27**

click in the **Center Face Set** box, **Fig. 26**
click the **two top faces of fuselage**, **Fig. 28**

click in the **Face Set 2** box, **Fig. 26**

rotate view to view **right face**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 29**

click **right face of fuselage**, **Fig. 29**
click OK, **Fig. 30**.

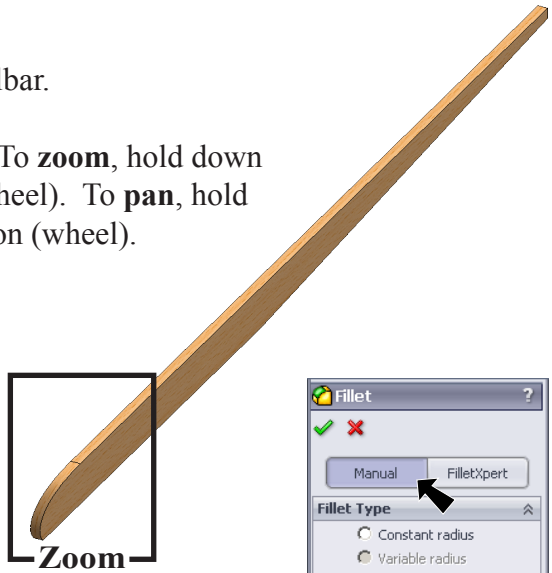

Fig. 25

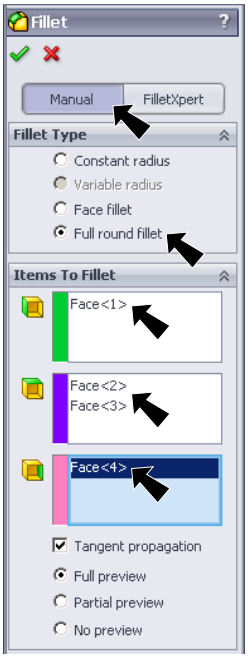

Fig. 26

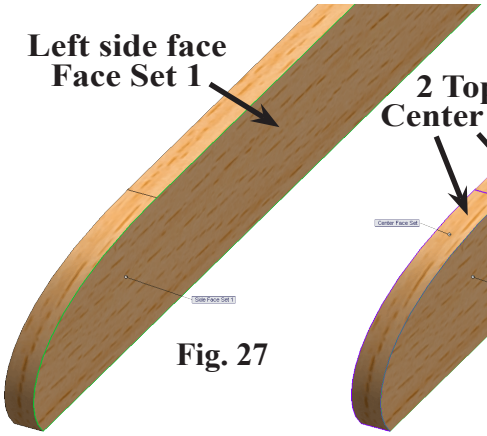

Fig. 27

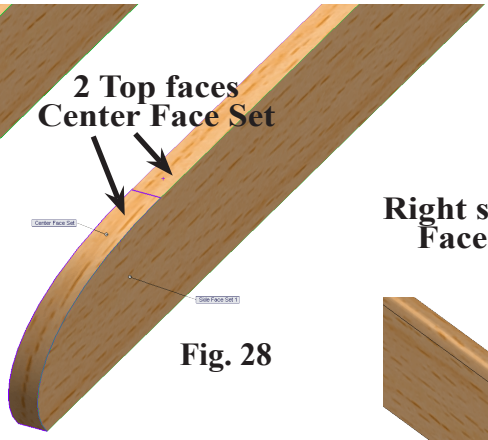

Fig. 28

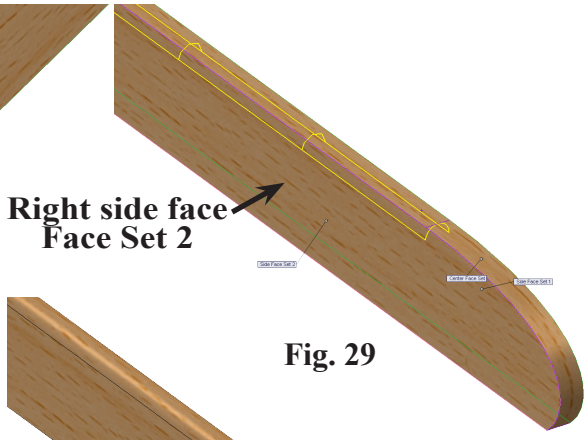

Fig. 29

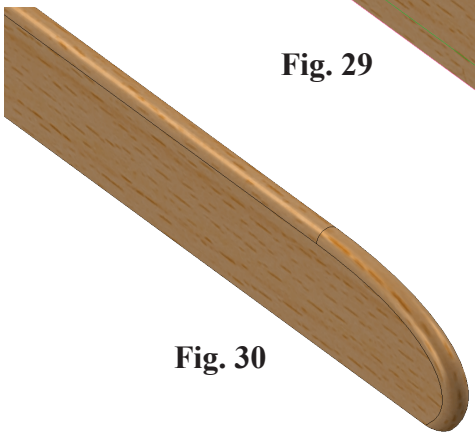
Fig. 30

I. Save, then Save As "SHARK TOOTH".

Step 1. Click **Trimetric**  on the Standard Views toolbar.

Step 2. Save. **Very important to save** at this time.
Use **Ctrl-S** to save FUSELAGE.

Step 3. Click File Menu > Save As.

Step 4. Key-in **SHARK TOOTH** for the filename and press ENTER. Next, we change contour for Shark Tooth.

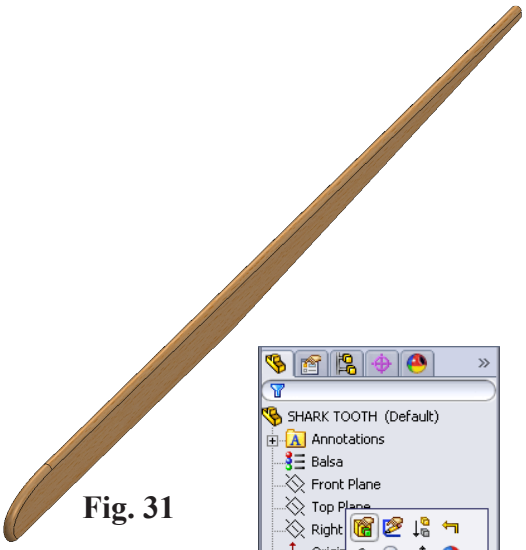

Fig. 31

J. Change Cut Extrude1 Contour.

Step 1. Click **Cut-Extrude1** in the Feature Manager and click **Edit Feature**  in the menu, **Fig. 32**.

Fig. 32

Step 2. Click **Normal To**  on the Standard Views toolbar. (**Ctrl-8**)

Step 3. In the Property Manager:
right click in the Select Contours box and click **Clear Selections** from menu, **Fig. 33**
click **Tooth shaped contour** in graphics area, **Fig. 34** and **Fig. 35**
click OK  , **Fig. 36**.

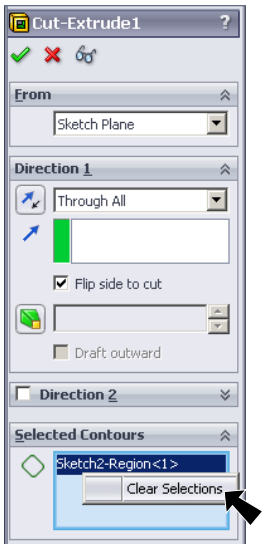

Fig. 33

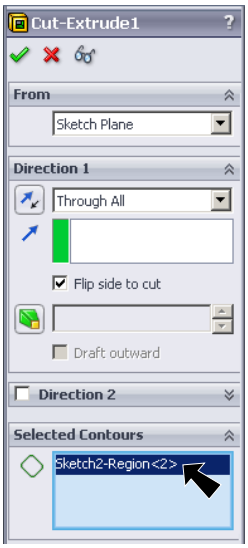

Fig. 35

K. Delete Fillet Feature.

Step 1. Click **Fillet1** in the Feature Manager and press Delete key on keyboard, **Fig. 37**.

Step 2. Save. Use **Ctrl-S**.

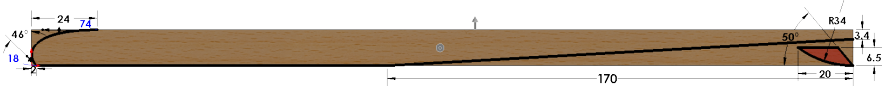

Fig. 34

Fig. 36

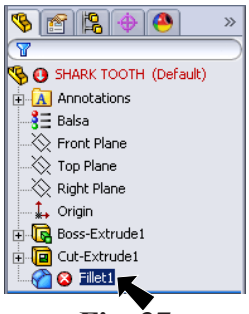

Fig. 37

L. Fillet Full Round 1.

Step 1. Click **Dimetric** on the Standard Views toolbar.

Step 2. Click Zoom to Fit (F) on the View toolbar.

Step 3. Click **Fillet** on the Features toolbar.

Step 4. In the Fillet Property Manager set:
select **Manual**, **Fig. 38**
under **Fillet Type**
select **Full round fillet**

click in the **Face Set 1** box
click **left side face**, **Fig. 39**

click in the **Center Face Set** box, **Fig. 38**
click the **front face**, **Fig. 39**

click in the **Face Set 2** box, **Fig. 38**

rotate view to view **right face**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 40**

click **right face**, **Fig. 40**
click OK , **Fig. 41**.

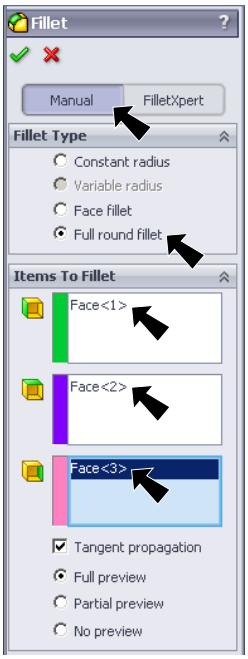

Fig. 38

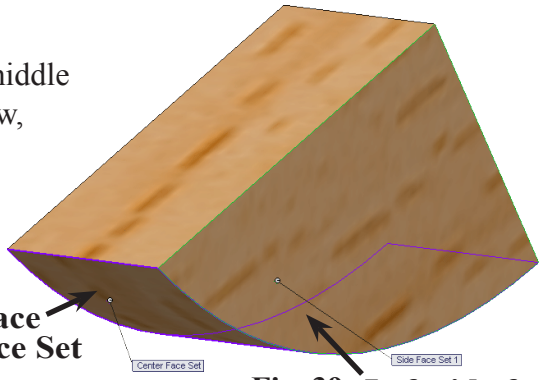

Fig. 39 **Left side face Face Set 1**

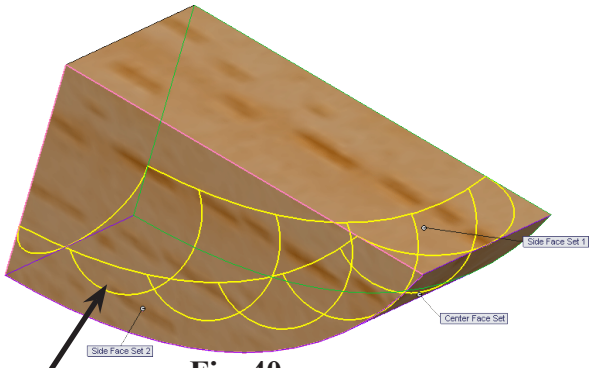

Fig. 40

Right side face Face Set 2

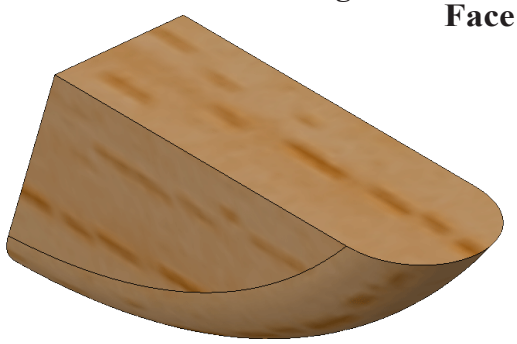

Fig. 41

M. Fillet Full Round 2.

Step 1. Click **Fillet**  on the Features toolbar.

Step 2. In the Fillet Property Manager set:
under **Fillet Type**, **Fig. 42**
select **Full round fillet**

click in the **Face Set 1**  box
click **right side face**, **Fig. 43**

click in the **Center Face Set**  box, **Fig. 42**
rotate view to view **rear face**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 44**
click the **rear face**, **Fig. 44**

click in the **Face Set 2**  box, **Fig. 42**
uncheck Tangent propagation

click **Isometric**  on the Standard Views toolbar
click **left side face**, **Fig. 45**
click OK  , **Fig. 46**.

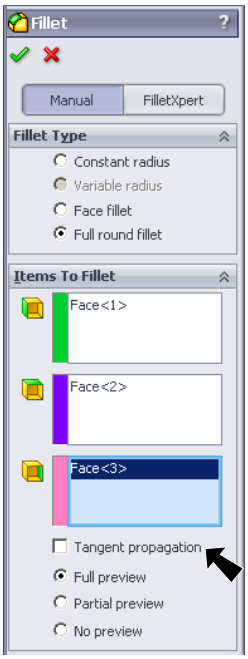

Fig. 42

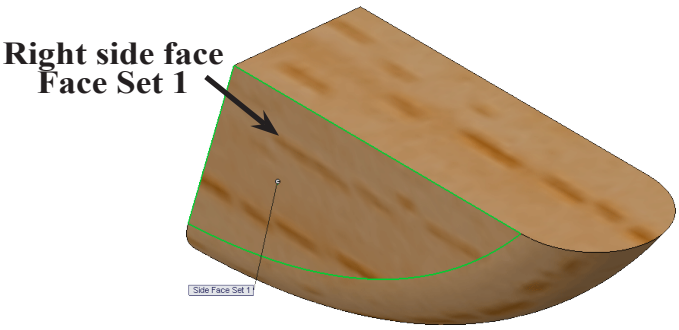

Fig. 43

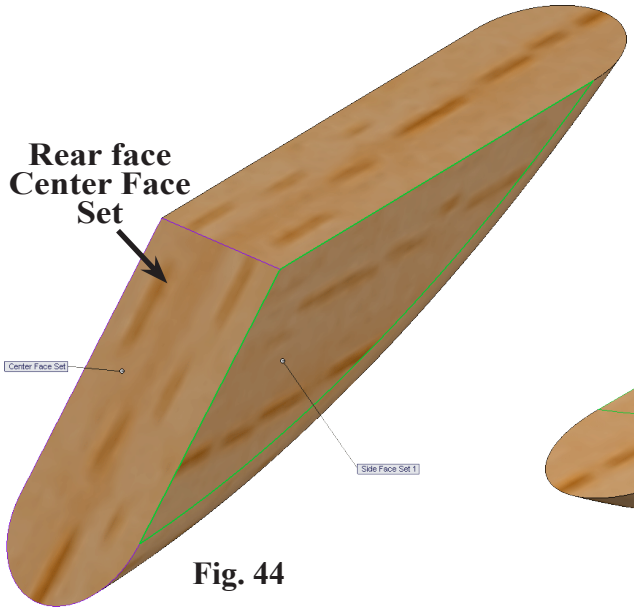

Fig. 44

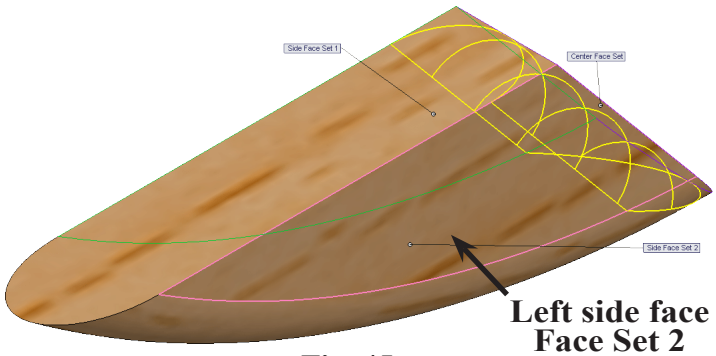

Fig. 45

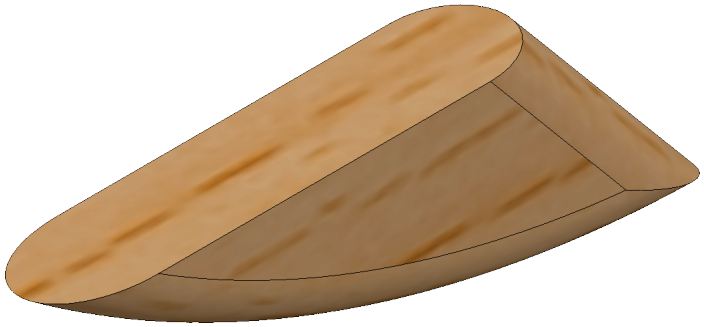

Fig. 46

N. Fillet Edge Constant Radius.

Step 1. Click **Fillet** 

on the Features toolbar.

Step 2. In the Fillet Property Manager set:
under **Fillet Type**
select **Constant radius**, **Fig. 47**

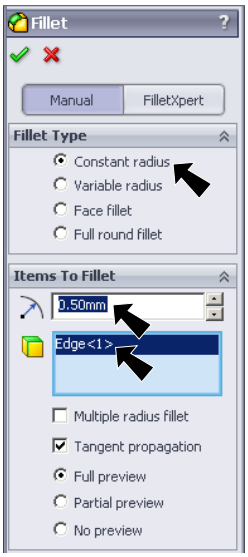

Fig. 47

Radius  **.5**
click **bottom rear edge**, **Fig. 48**
click OK  .

Step 3. Save. Use **Ctrl-S**.

Fig. 48


Fig. 49