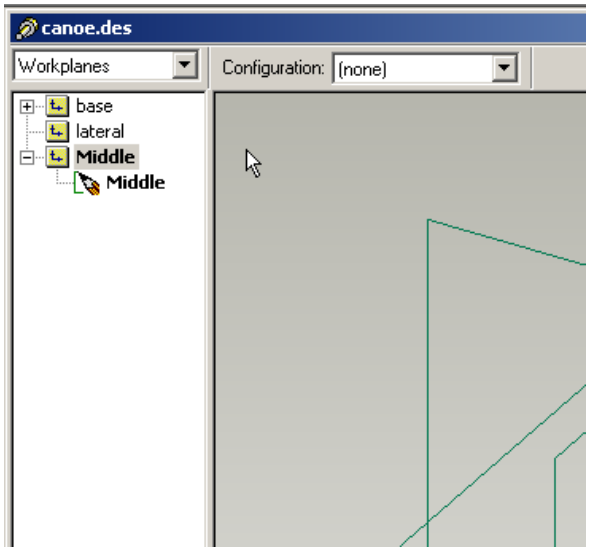
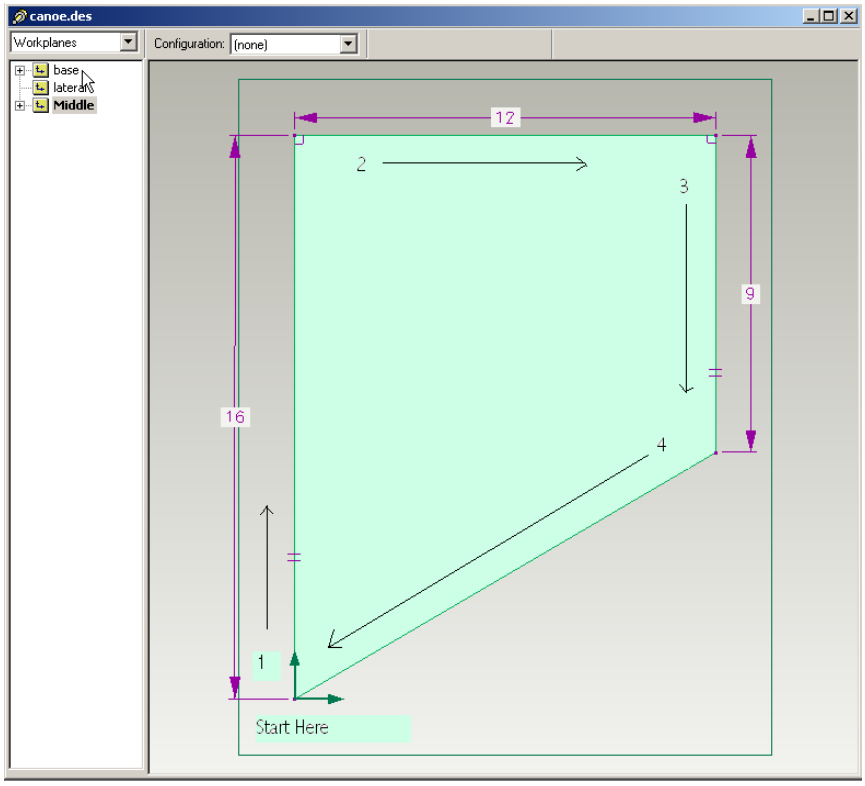
Canoe

- Mirroring
- Lofts

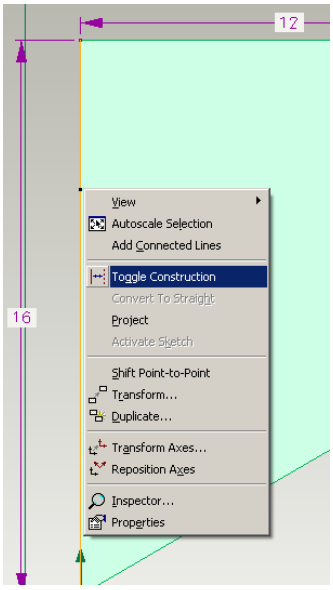
1. Set **Units** to **Inches**
2. Create a **New Design**.
3. Save the Design as "**canoeINL811**" in your "Canoe" folder.
4. Create a **New Sketch** on the **Frontal Workplane**. Name the Sketch "**Middle"**.
5. Rename the **Frontal Workplane** to **"Middle"** by clicking on it ***ONCE***, then type "Middle" in place of "Frontal".

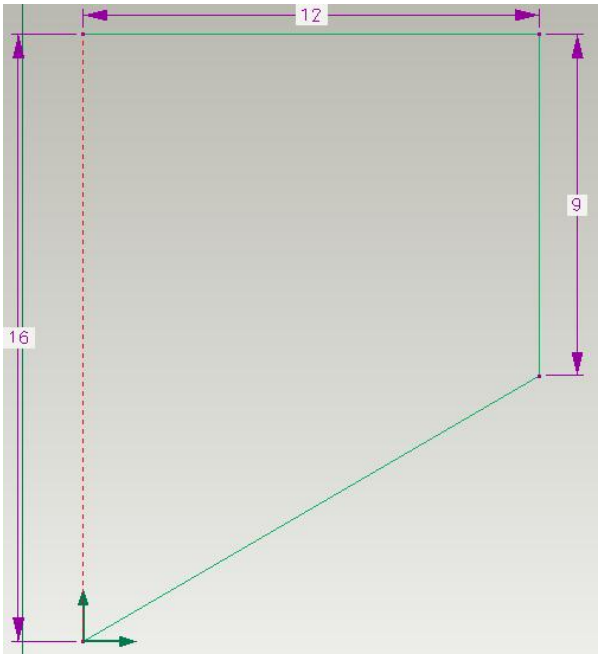


6. Shift-W to View Onto Workplane.
7. **Drag out** and **dimension** a sketch **as below.**

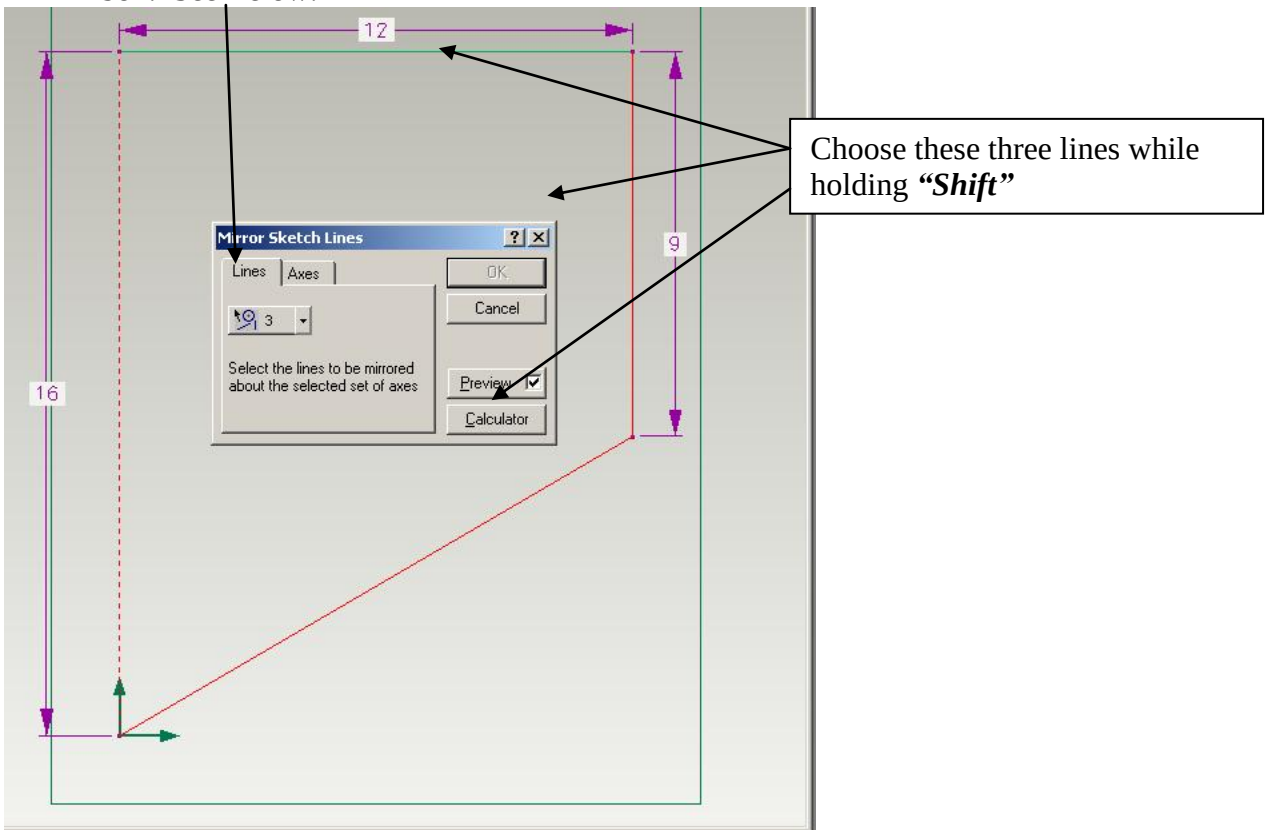


8. Select  the left, vertical line. **Right Click -> Toggle Construction**. This turns the vertical line into a reference – or ***construction*** – line. See Below. Notice that the line is now "dashed", meaning it is a ***construction line***.

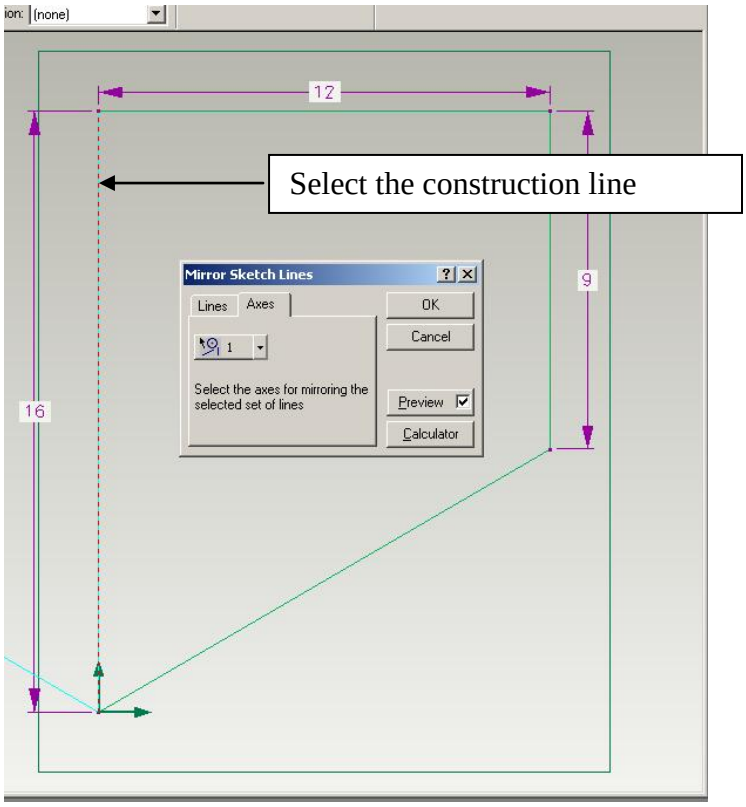




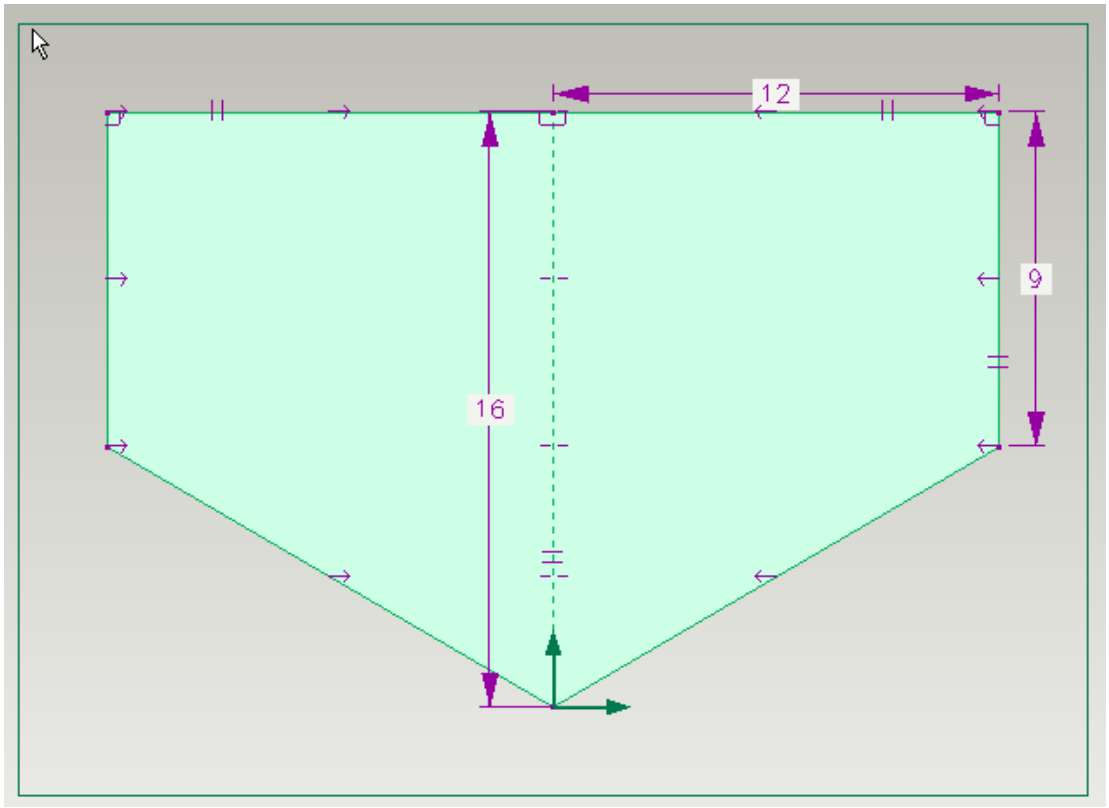
9. Go to **Line -> Mirror**. Select the ***Lines*** tab. Hold **Shift**, then select the ***12" horizontal***, the ***9" vertical*** and the ***diagonal*** lines. There should be a "3" in the lines box. See Below:



10. Click on the **Axes** tab. Choose the **16" construction line**. See Below:



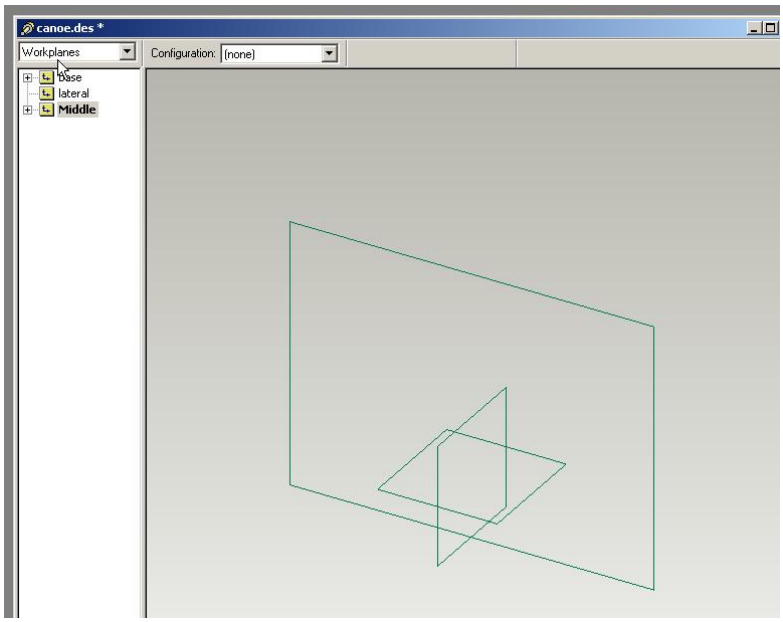
11. Click **OK**, and your sketch should look like the one below, with the appropriate lines "mirrored". If you change a dimension on the ***original side***, it will also change the ***mirrored*** dimension.



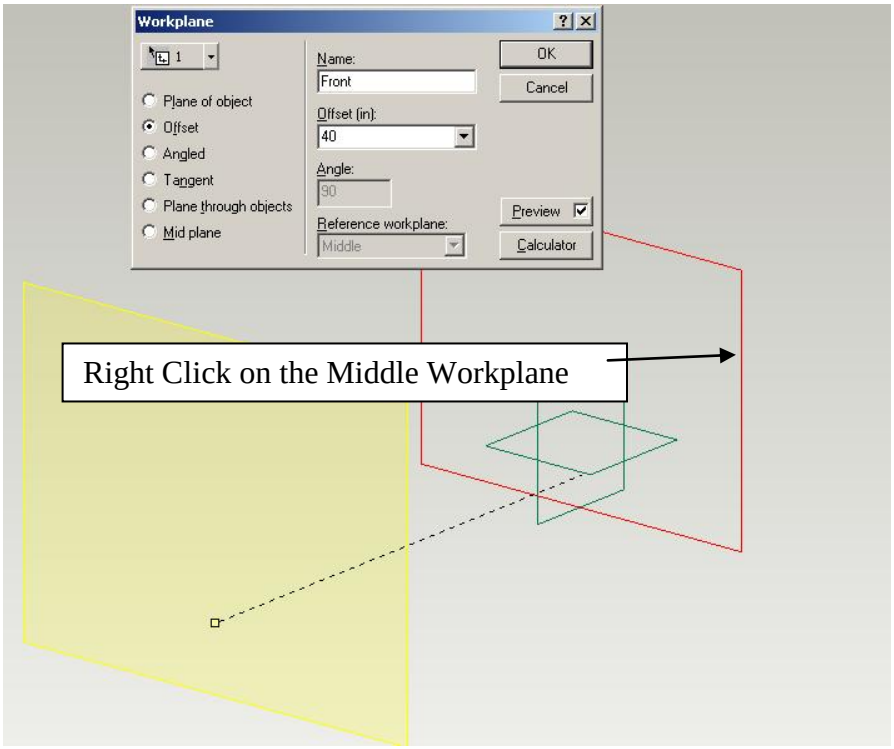
12. Save your Work!!

You are now going to create two New Workplanes to finish the canoe.

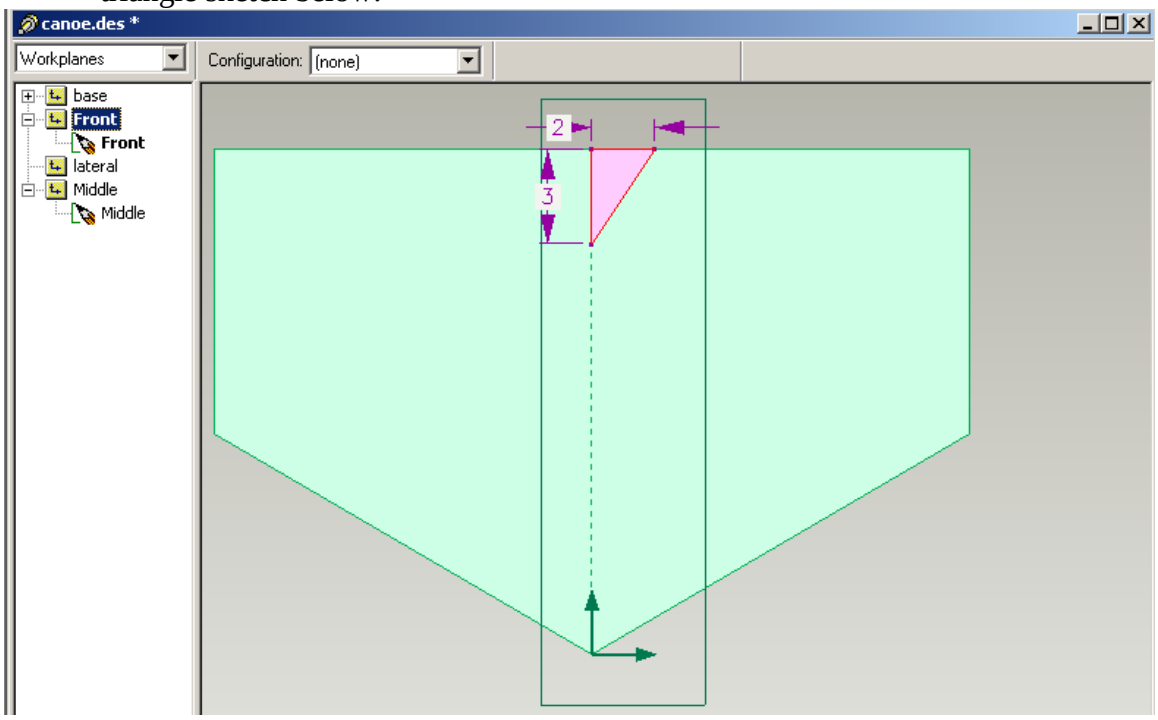
13. **Shift-T** to View Trimetric. Click on the Workplane tool  from the design toolbar. You will notice that you sketch has disappeared. Don't worry – you have not deleted or lost any work. See below:



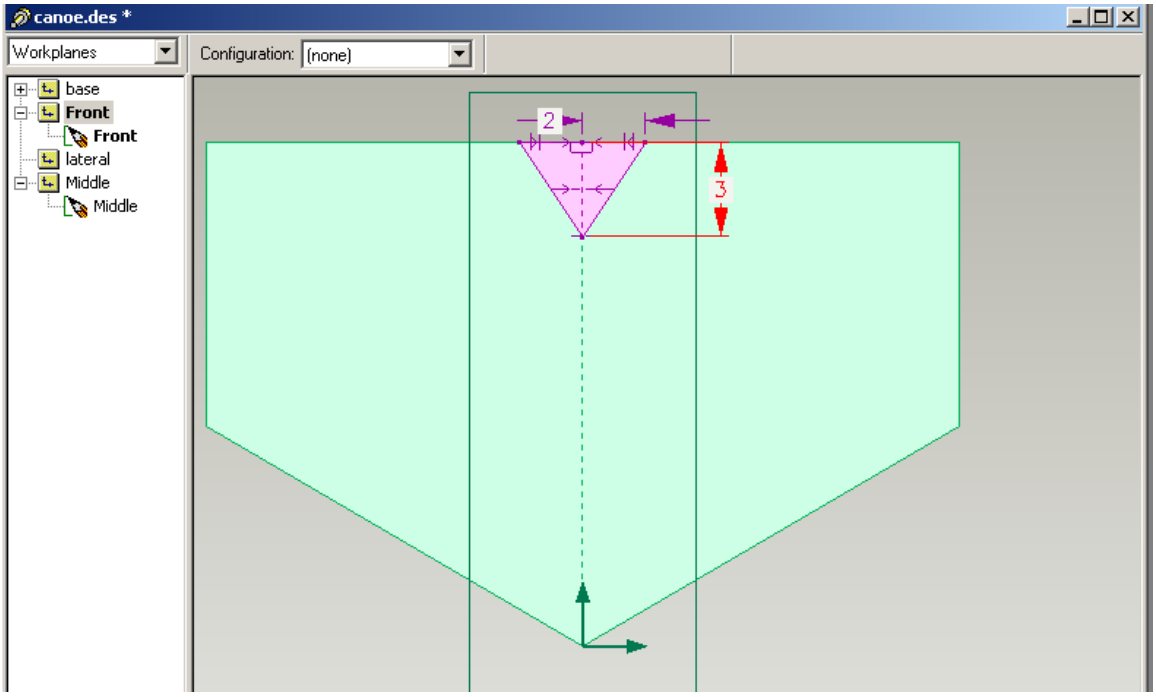
14. Click on the **Middle Workplane** in the **Design Window** to select it. **Right Click** on it, and select **New Workplane**. Name the workplane **Front**, and set the offset to **40"**. Click OK.



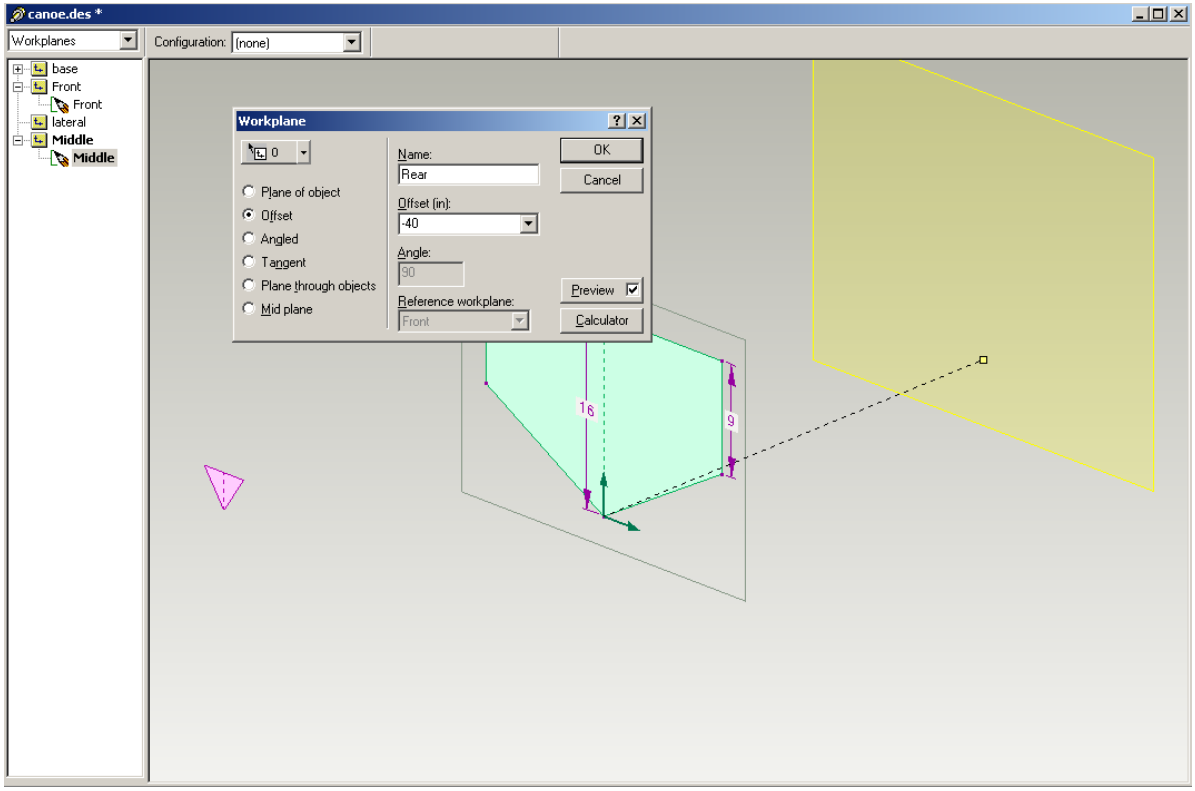
15. **Right Click** on the **Front** workplane in the **Browser window**, and create a **New Sketch**. Name the sketch **"Front"**. **Shift –W** to View onto Workplane. Create the triangle sketch below:



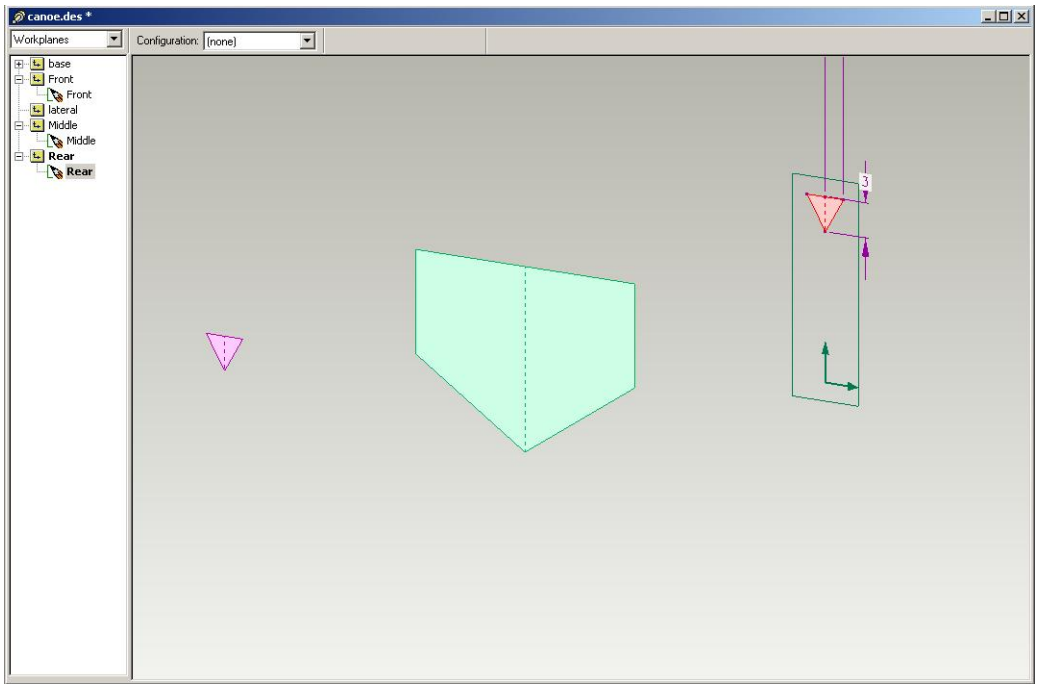
16. **Right Click** on the 3" line to make it a **Construction Line**. ***Mirror*** the lines to create the triangle below.



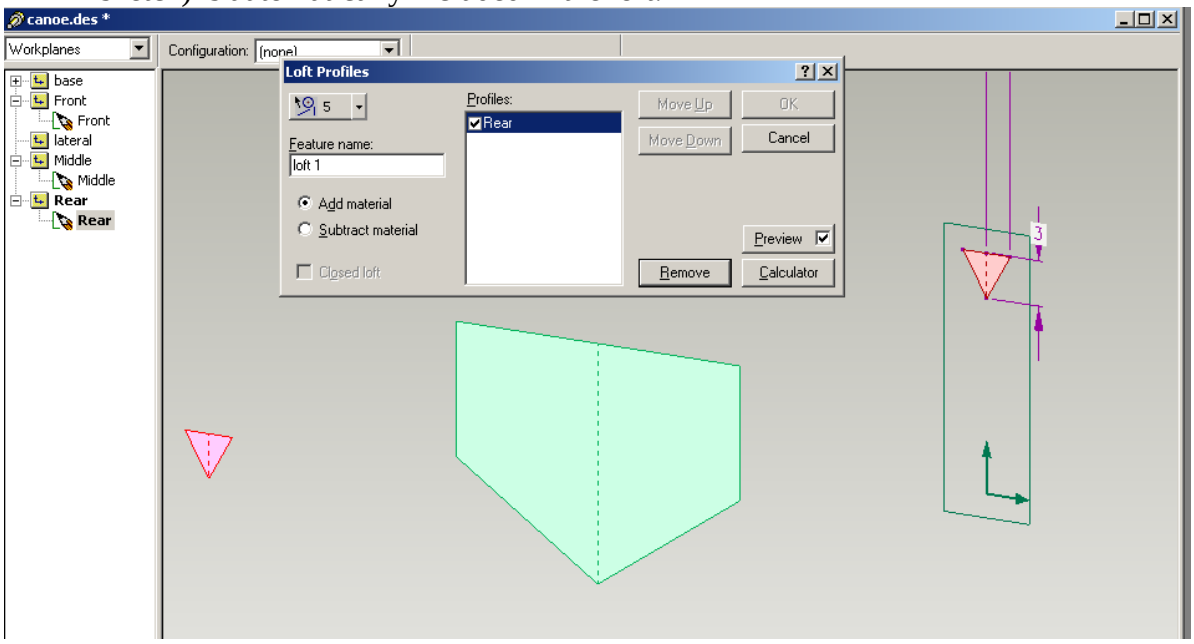
17. You are now going to **Copy** the sketch onto a New Workplane. **Select Lines**  , then go to **Edit-> Select All**, then **Edit -> Copy**. Your triangle sketch is on the Windows clipboard – we will use it soon!
18. Click on the **Middle Workplane** in the **Design Window** to select it. **Right Click** on it, and select **New Workplane**. Name the workplane **Rear,** and set the offset to **-40"**. Click OK. See Below:



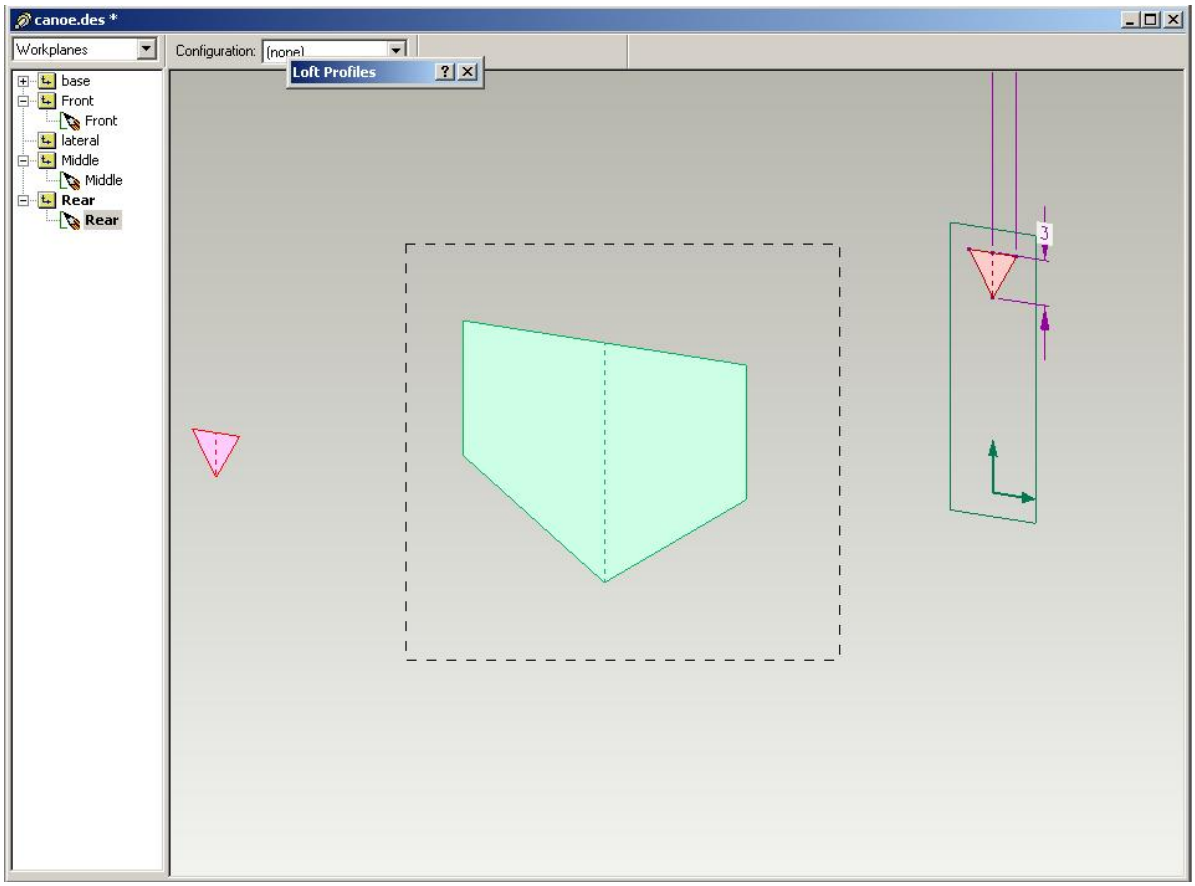
19. **Right Click** on the **Rear** workplane in the **Browser** window, and create a **New Sketch**. Name the sketch ***"Rear"***. **Shift –W** to View onto Workplane. Paste the triangle sketch, as below:

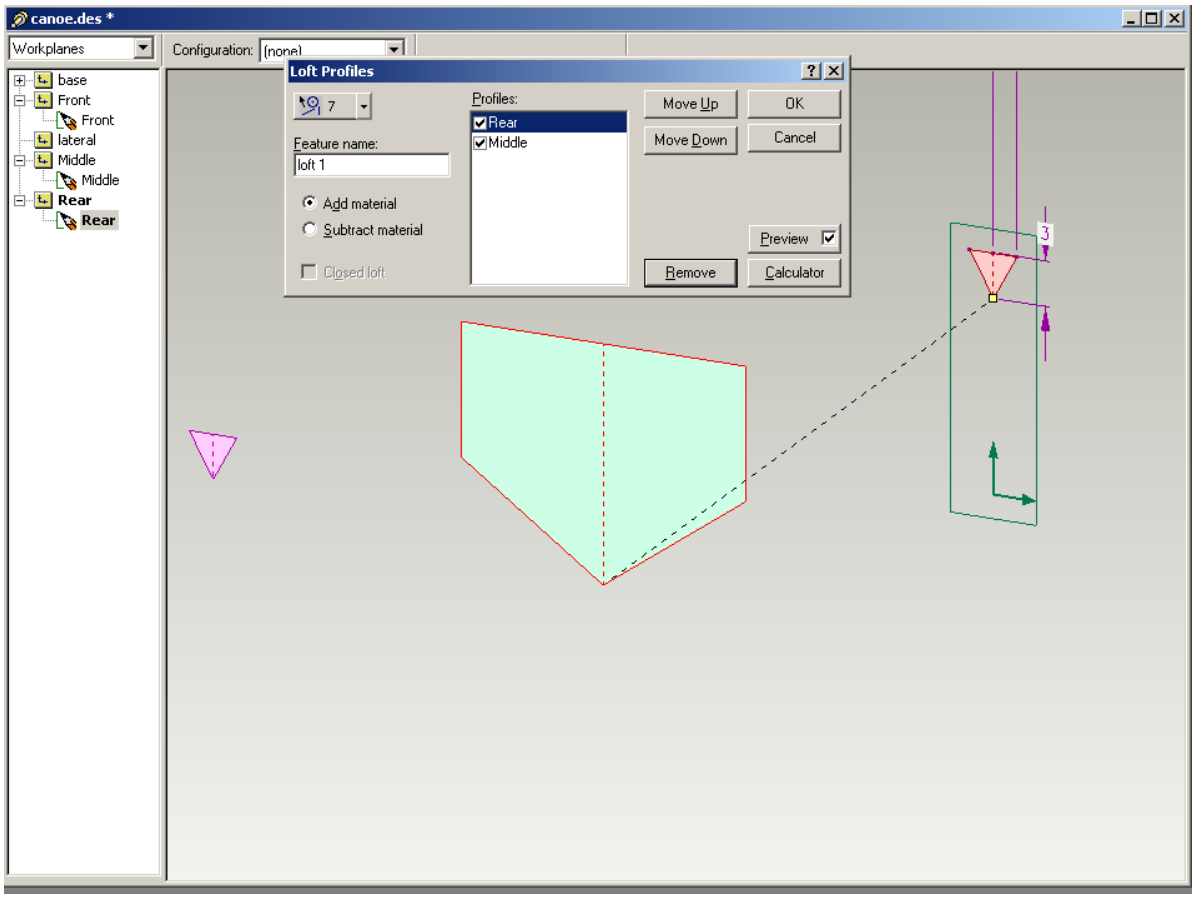


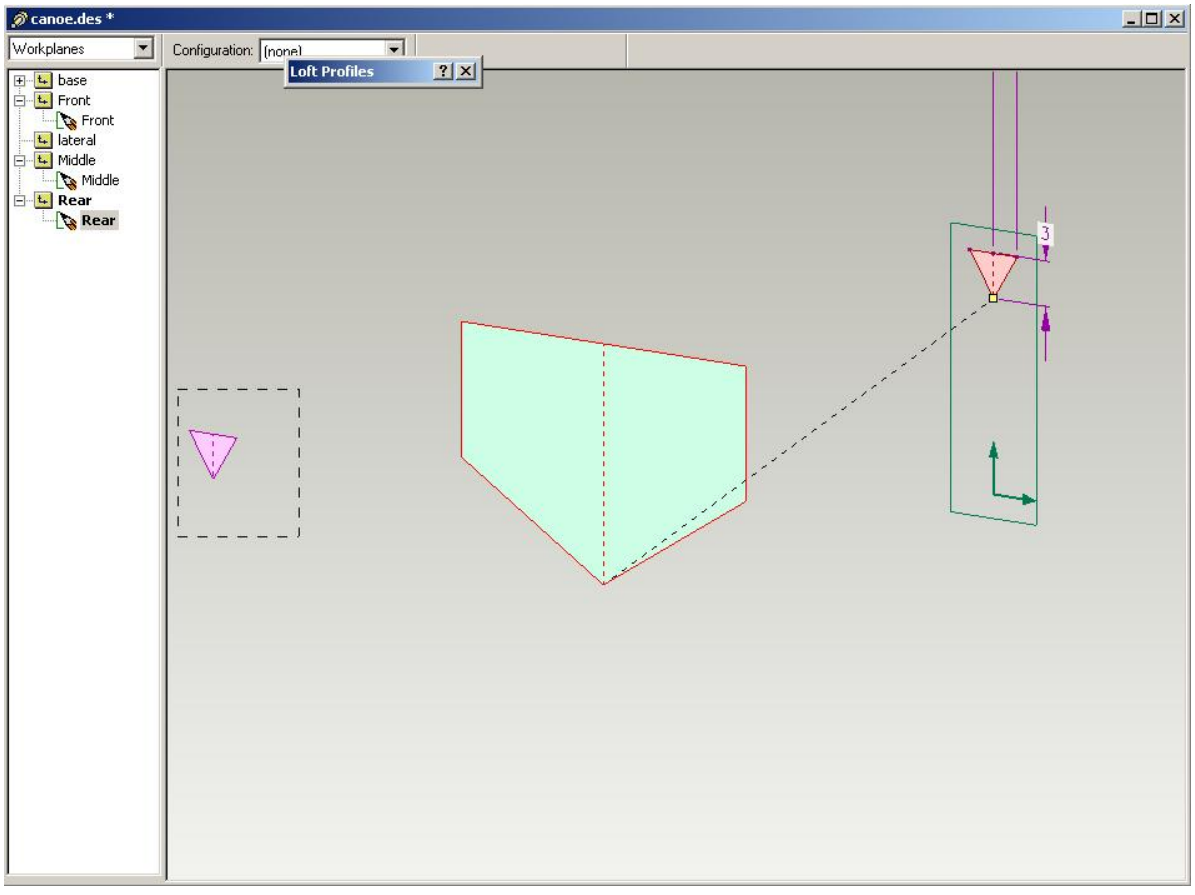
20. You can see from the three sketches above what the basic shape of our canoe will be. Using the ***Loft*** feature, you will pull (or extrude) material through these sketches to create the canoe shape.
21. Go to **Features -> Loft through profile**. The **Active Sketch** (in this case, the Rear sketch) is automatically included in the loft.

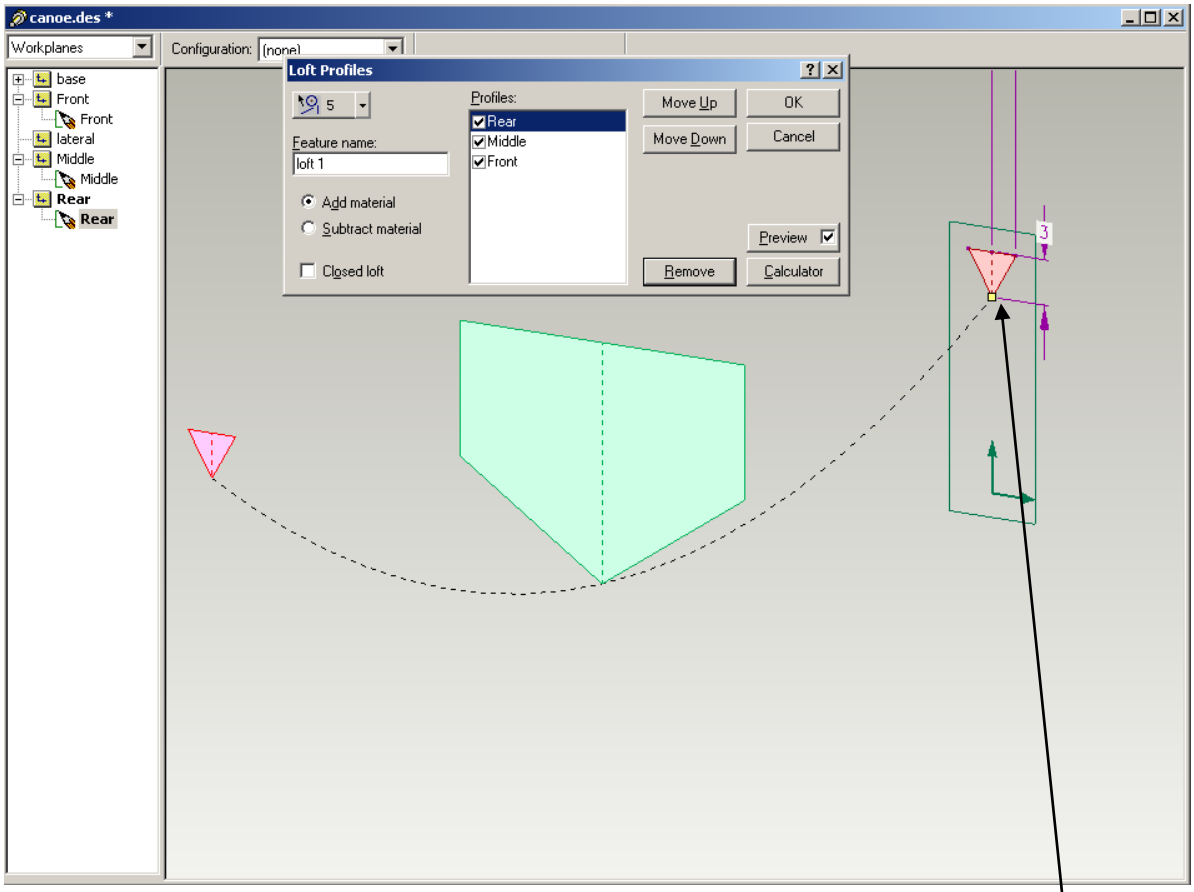


22. To add the other two sketches, **Select Lines**  and ***"lasso"*** each sketch. See below:

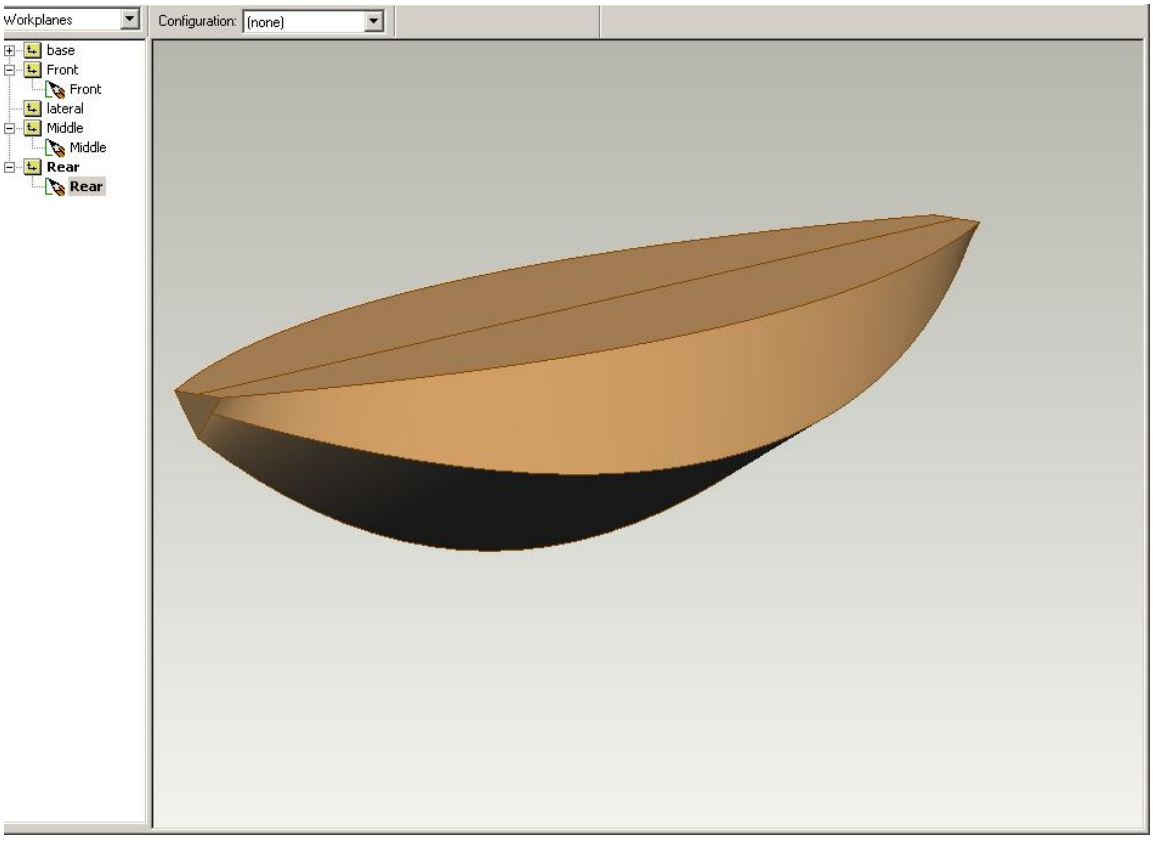




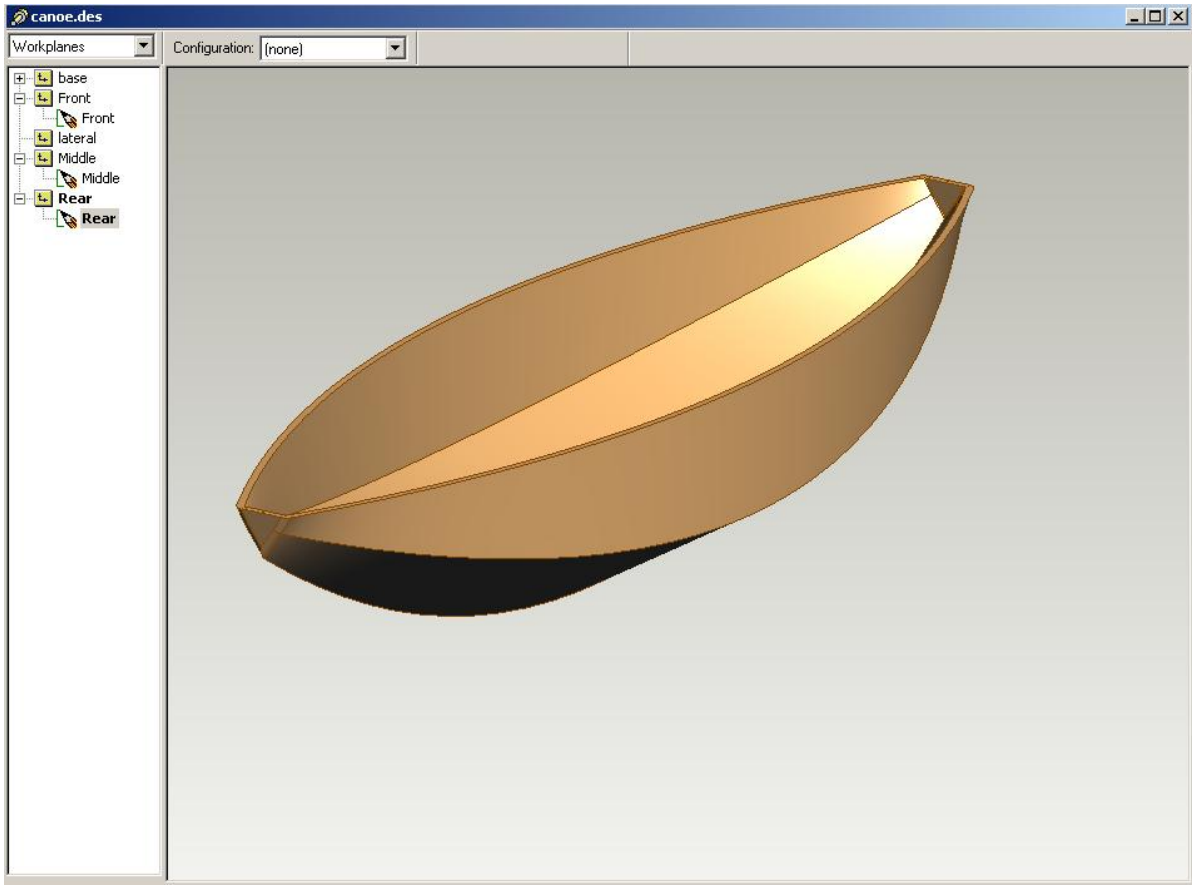




23. Notice the dotted line that curves below the bottom points. The yellow box indicates the position of the "loft flow" on the Active Sketch. If the "loft flow" isn't like the one above, you may need to click on and move the yellow dot. If it looks like the one above, click OK. Your finished loft should look like the one below:



24. Finish your canoe by rounding edges and shelling it out (Shell Solids).



** Our canoe has no seats! Can you figure out a way to put a bench seat inside? **