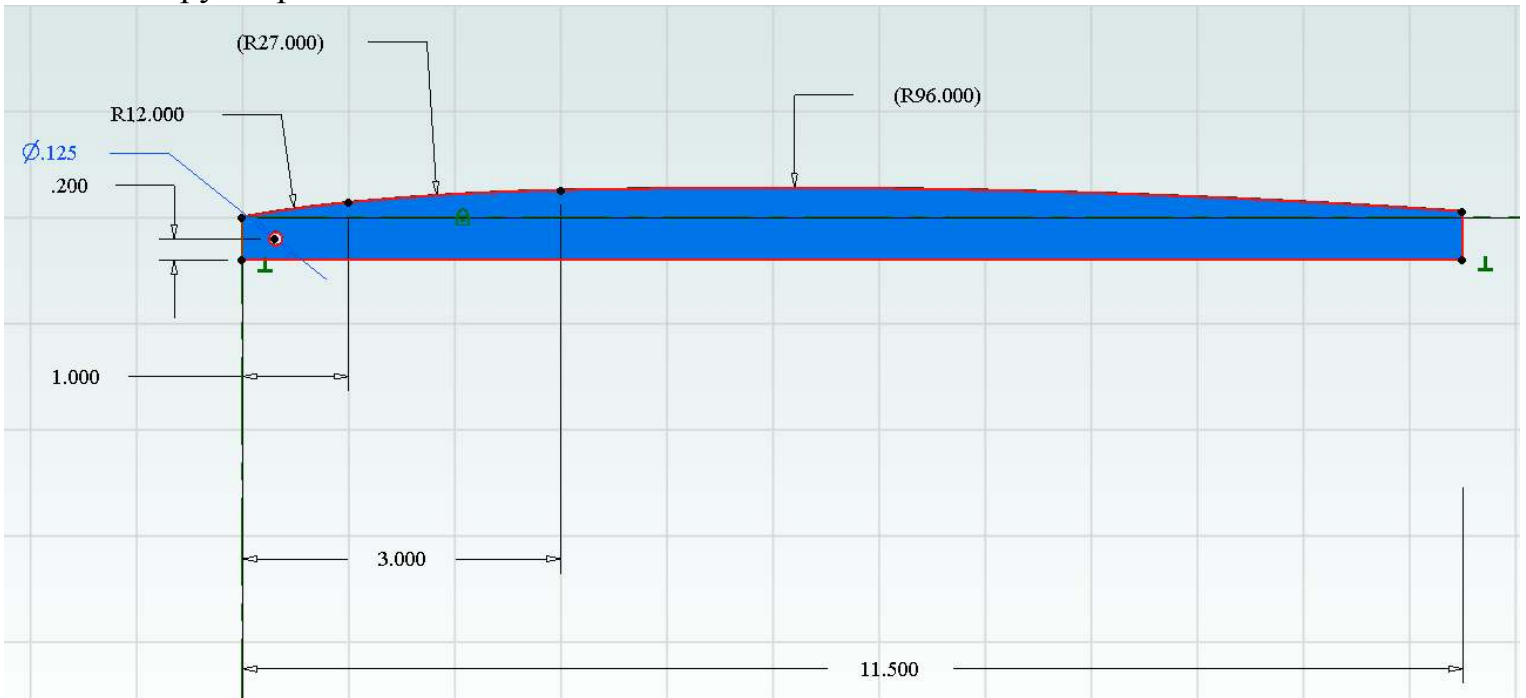


# Drawing Merged Radii with Alibre PE, version 1

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By R. G. Sparber

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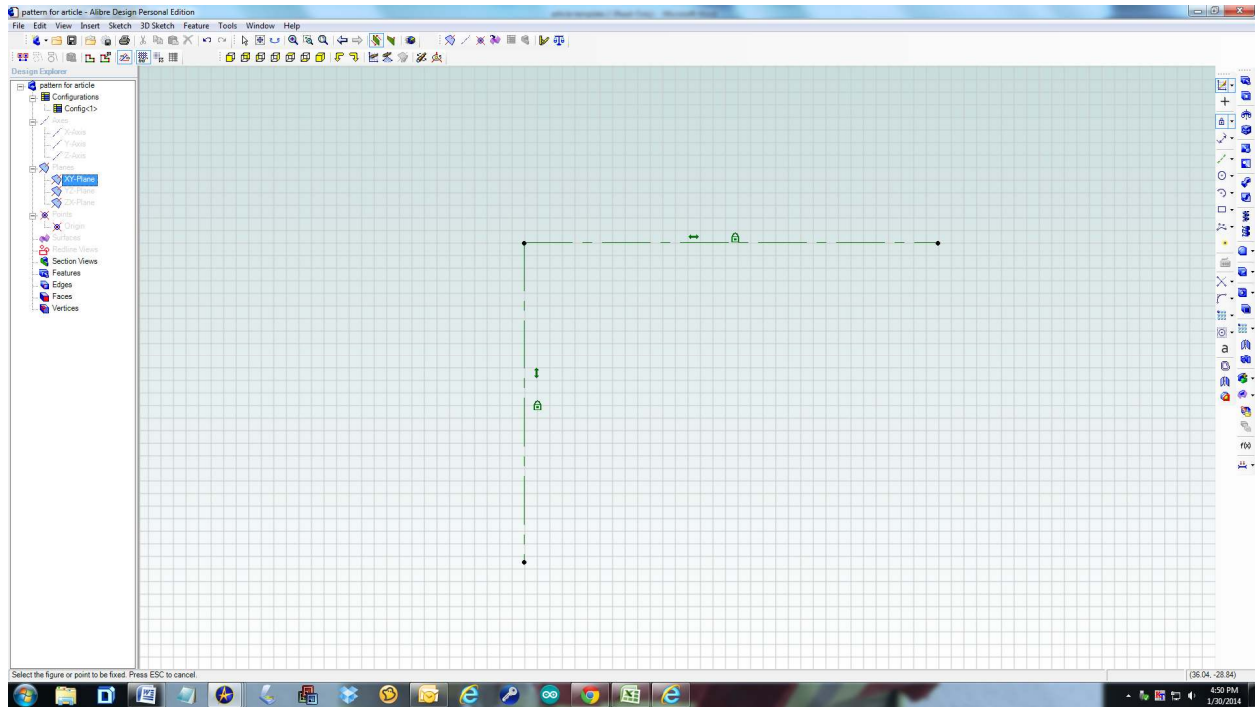


I recently needed to draw a profile that contained three radii. The transition point between radii was specified along with each radius. All tangents at these transition points had to match. Not much to go on but it turned out to be enough information to get the job done.

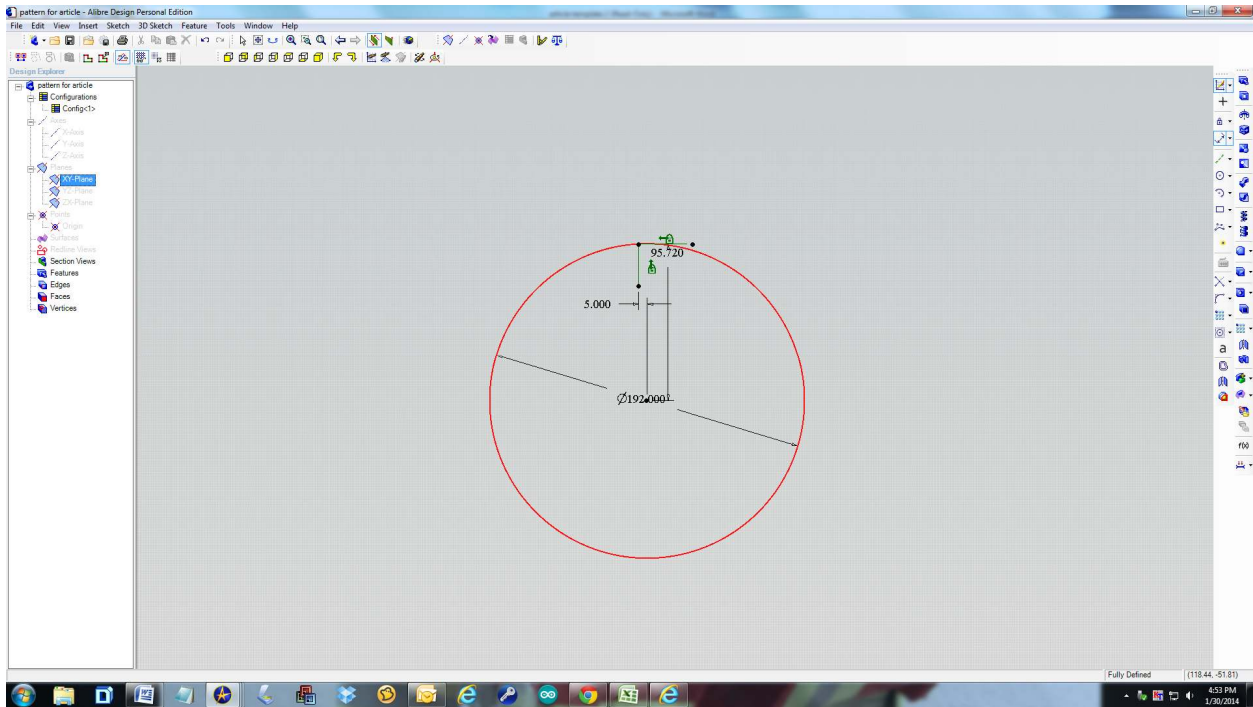
This article presents the steps needed to draw such a figure.

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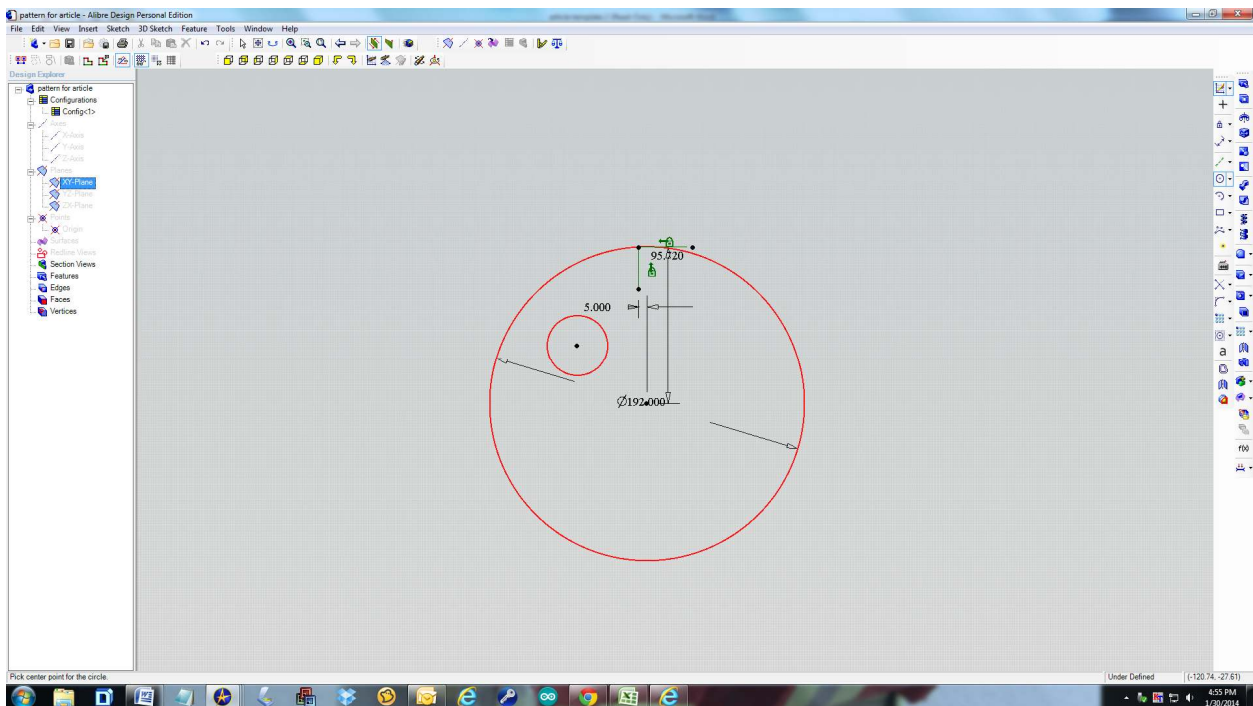
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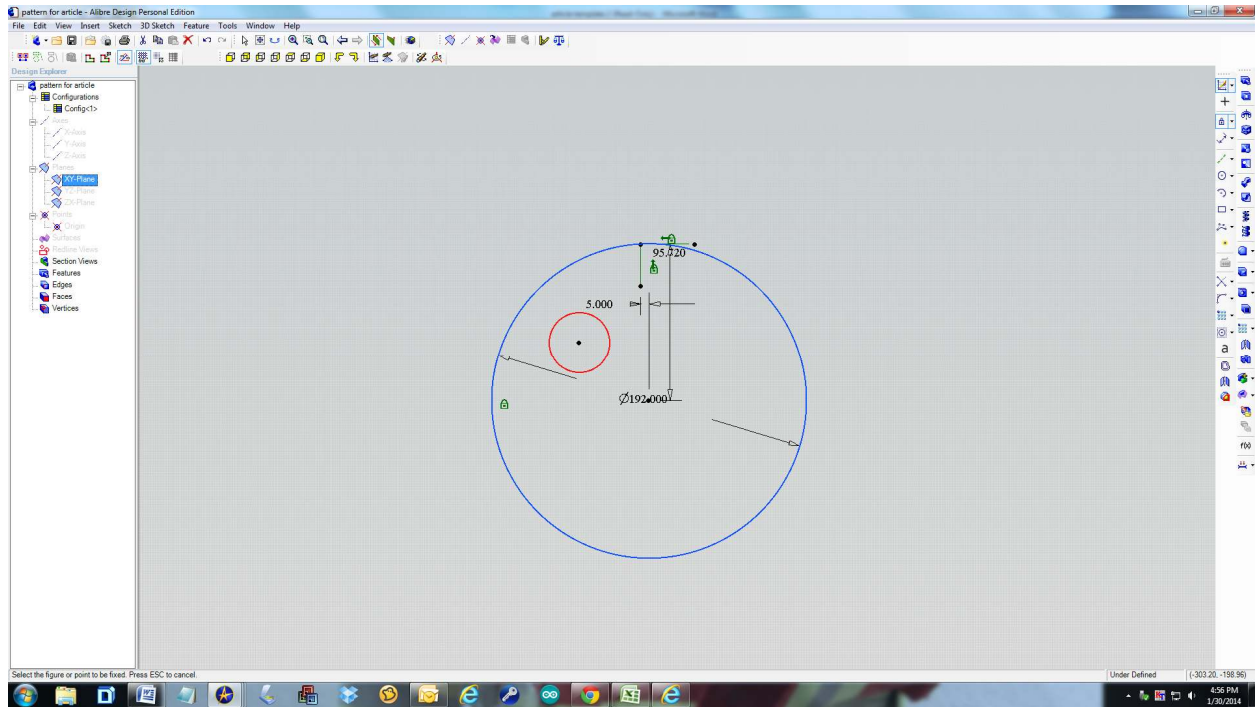
I started by defining my origin. An X and Y reference line were drawn and locked into position. Everything else will be referenced to these two lines so I certainly do not want them to shift.



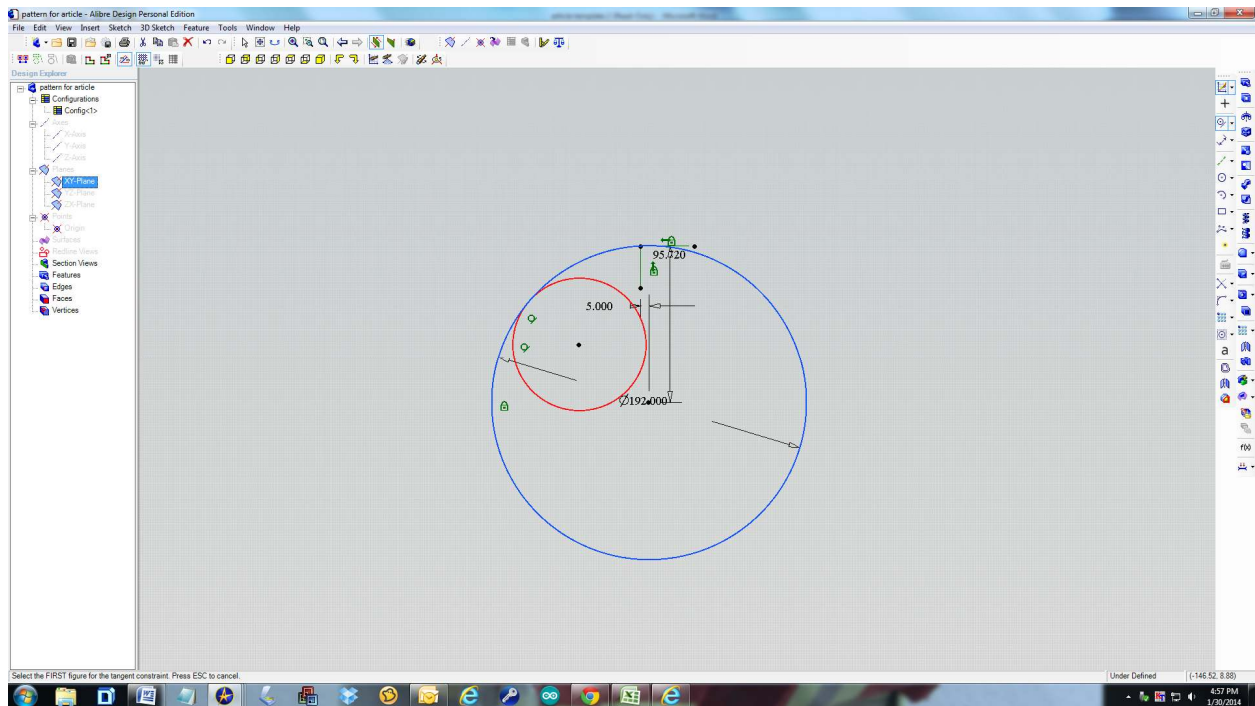
The center of the first circle is located with respect to the origin along with the diameter of the circle.



The second circle is drawn inside the first circle.

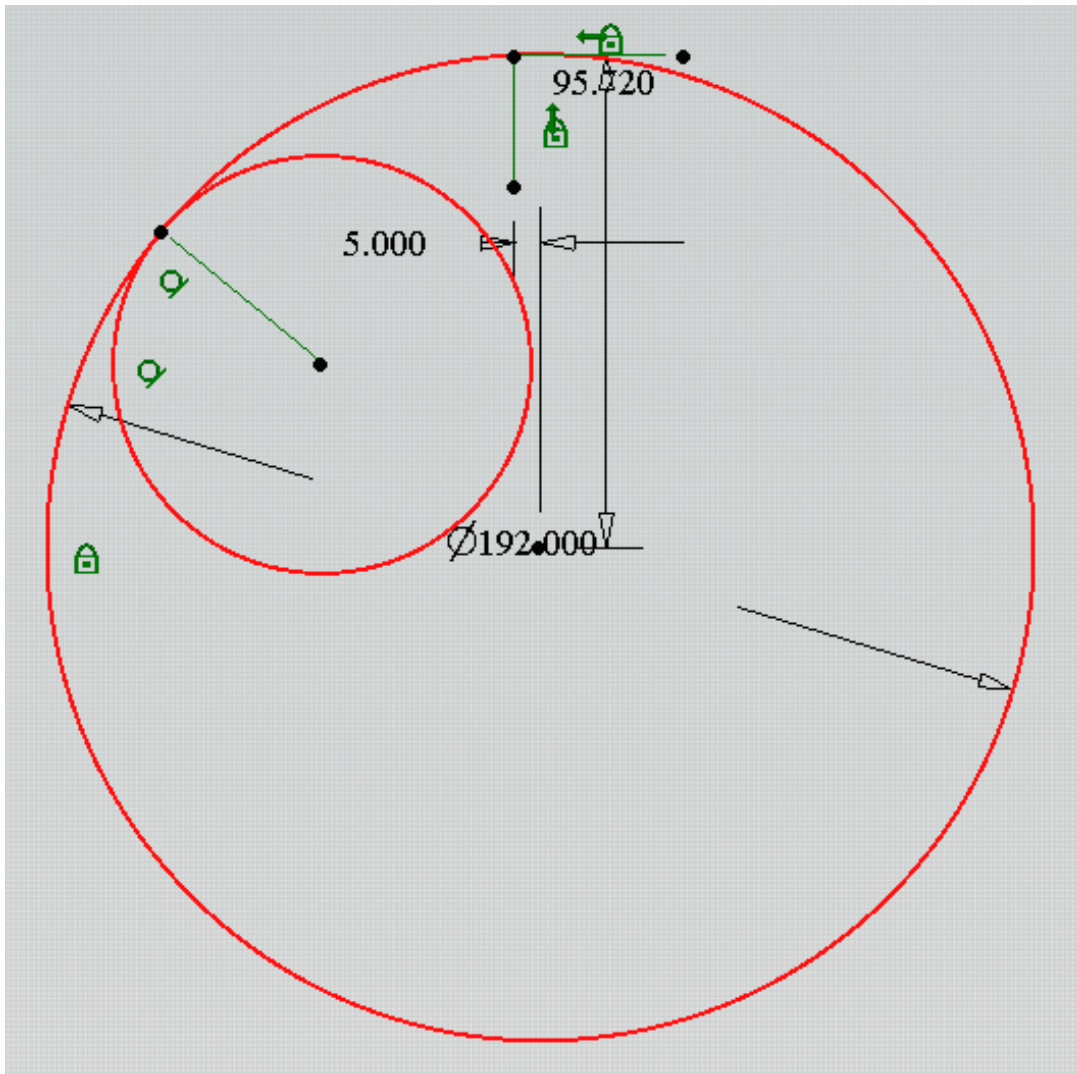


I locked the circle into position but later realized this was not necessary.

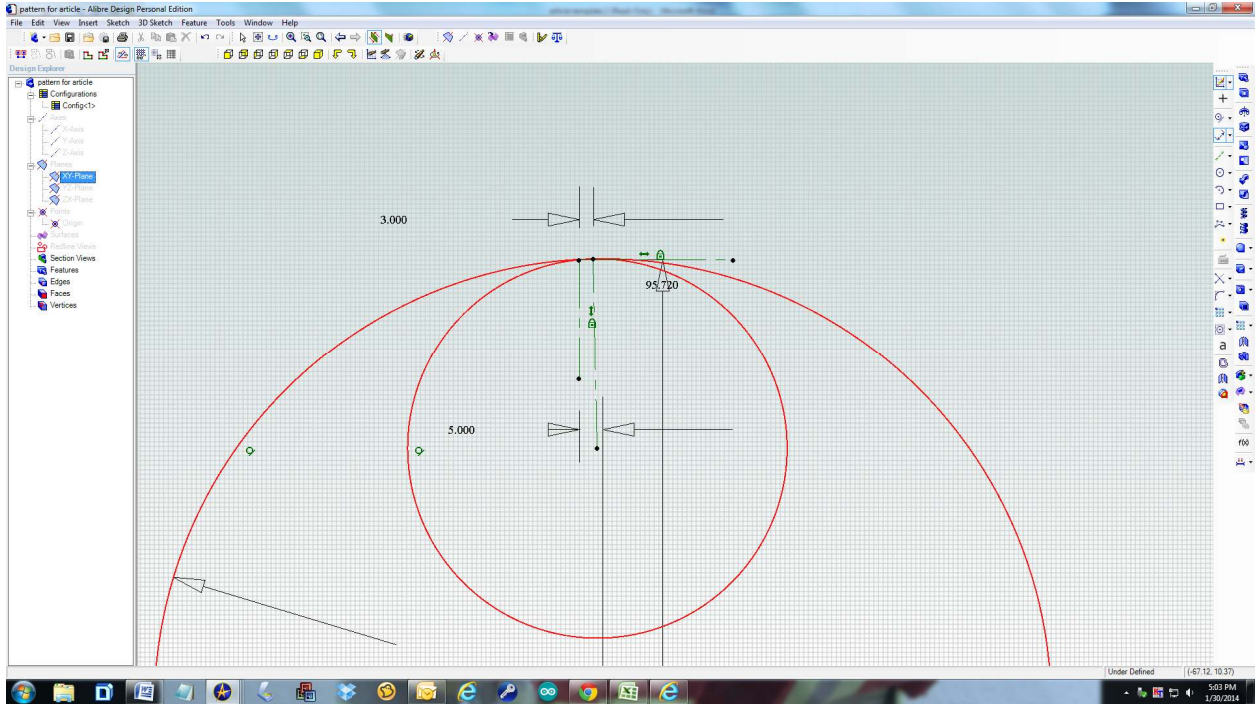


A Tangent Constraint is applied between the two circle. Notice that the larger circle did not move but the smaller circle increased in diameter. The two circles are now tangent. However, this tangent point is not in the correct position.

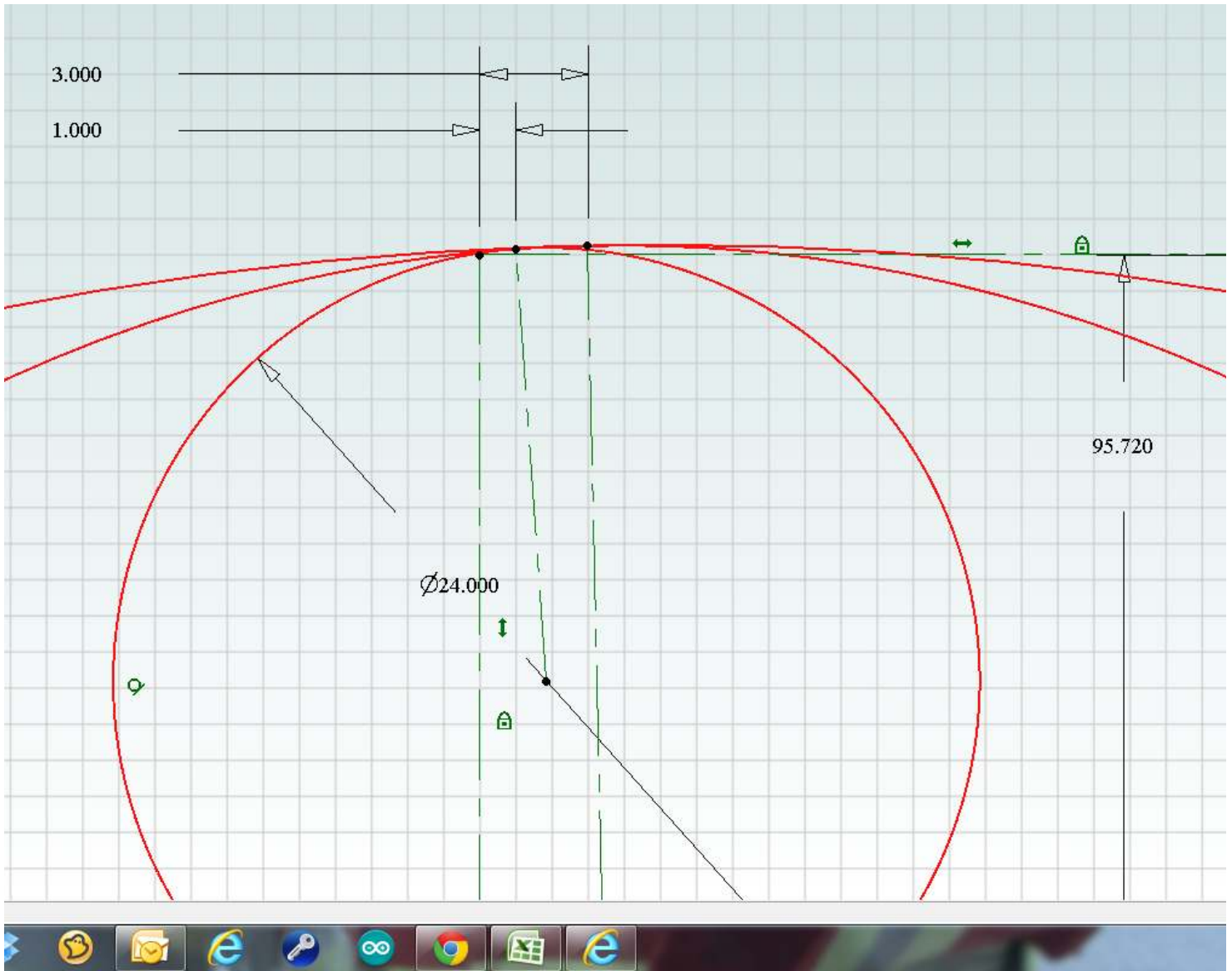




I now have a point on the two circles that marks the tangent. Using the cursor, I am able to slide this point around. The diameter of the second circled is defined. This could have been done at any time after the circle was drawn.



Using the dimension tool, I set this tangent point 3" from the origin.



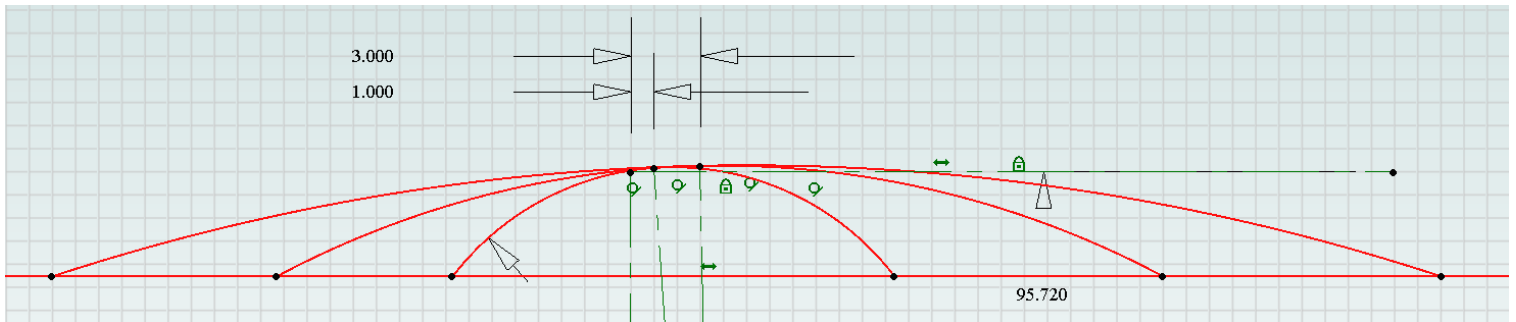
The process repeats for the third and final circle.

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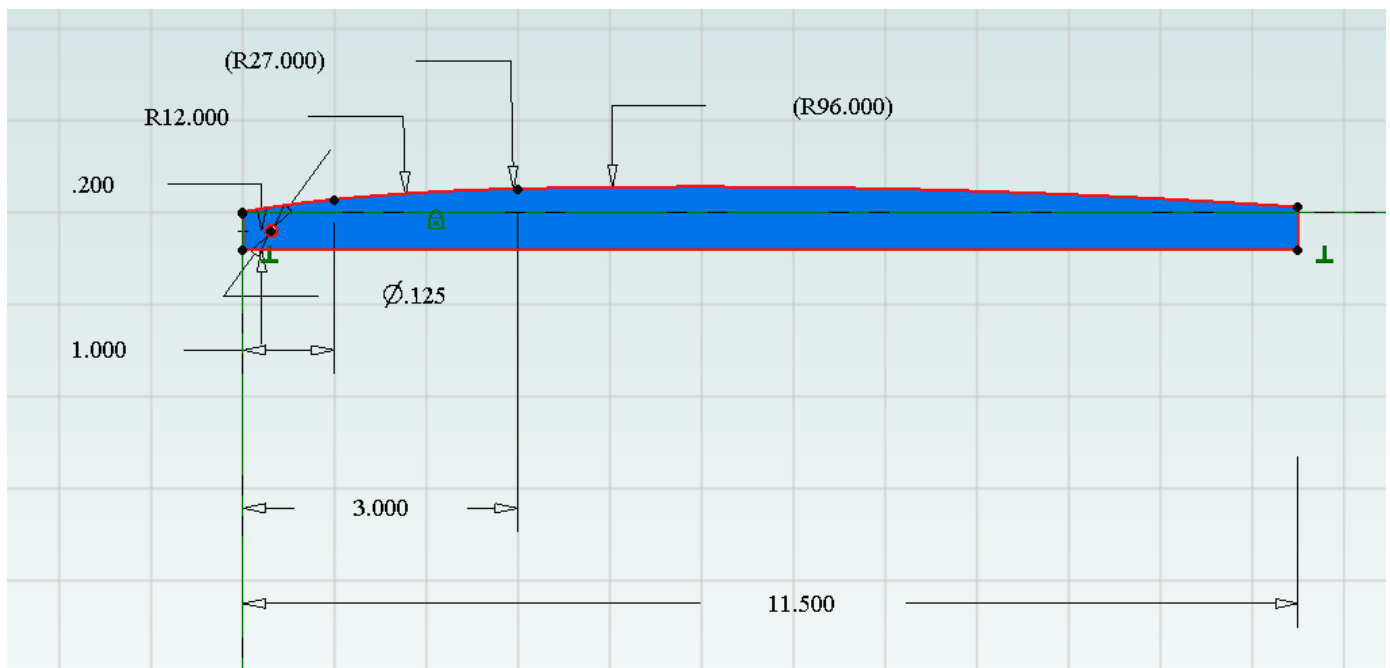
1. drew the circle inside the previous circle,
2. ~~locked the larger circle,~~
3. used the tangent tool to link the smallest circle with the medium sized circle,
4. drew a line from the center of the smallest circle to the tangent point,
5. defined the new circle's diameter (24"),
6. and then moved the tangent point the specified distance along the X axis (1").





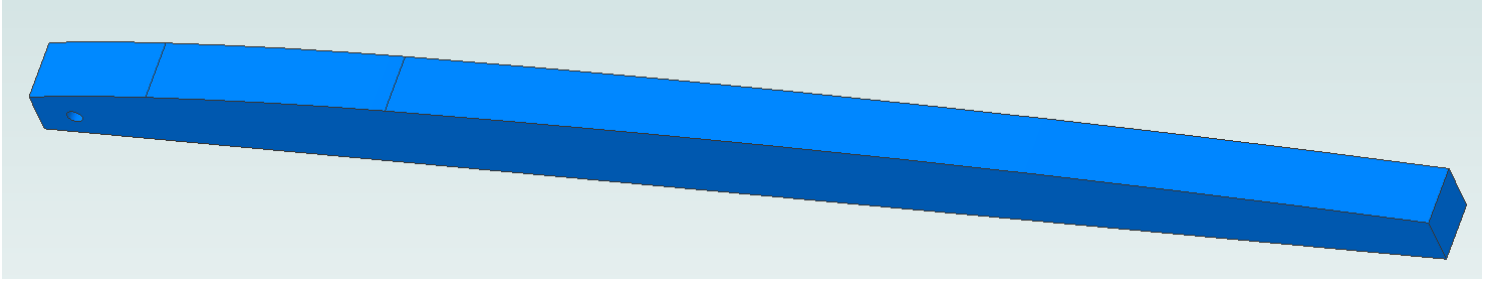


Using the Trim Figure tool, I removed the parts of the circles below the line. Then I removed the arcs that were not need in the final profile. Be very careful when doing this trimming. It is easy to remove the wrong arc and can be tricky to get it back.



The ends have been trimmed and a small hole added near the origin to assist with installation.

If you have made any mistakes, it is likely that Alibre will generate a ton of error messages related to line segments either not connecting or overlapping. They can be difficult to find. I suggest that you start by looking below the horizontal line for tiny line fragments. Then look around each black dot.



Here is the final 2-1/2 D part. The next step will be to have it cut using CNC.

I welcome your comments and questions.

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