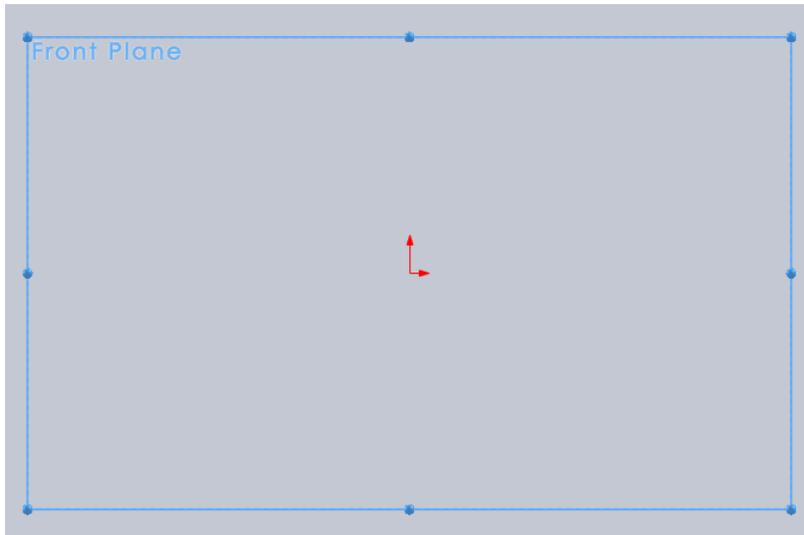


HW2: Measuring Cup

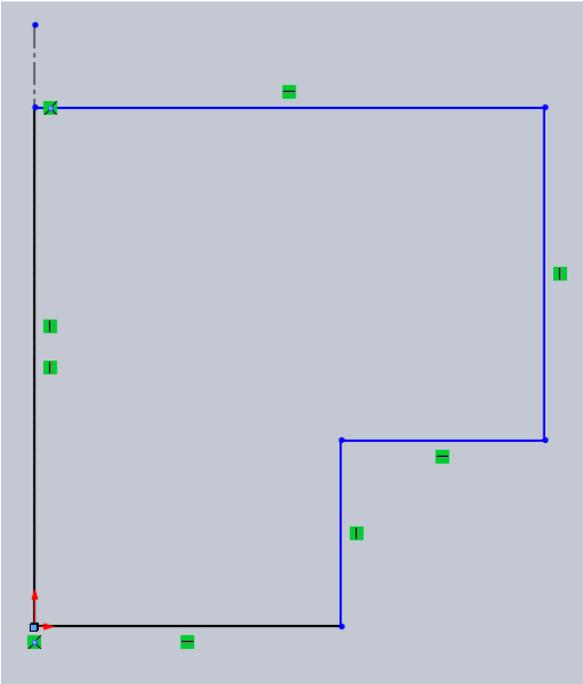
First, start out by picking the FRONT plane and opening a sketch.



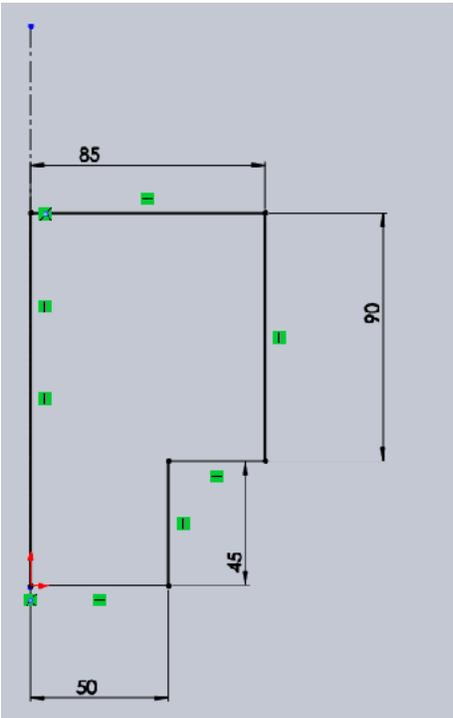
Good modeling practice: always put in the centerline first. **Another hint:** make sure the centerline is taller than your anticipated feature so it's visible if you ever open the sketch again! Adjust its length to ensure this dynamically as you sketch the profile if you need to.



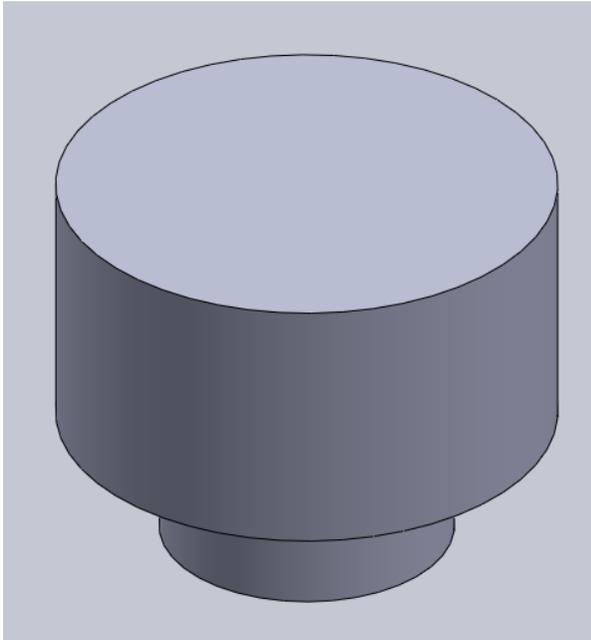
Since I know this is a two-step cup, I'll skip the rectangles and just draw the lines.



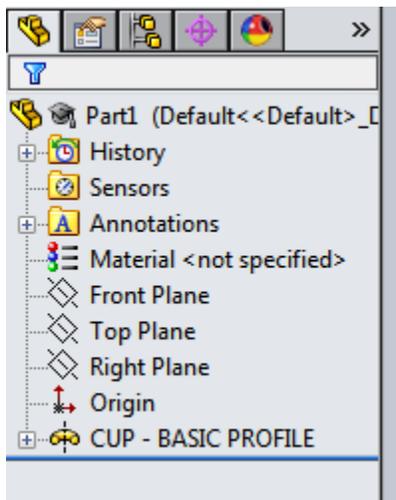
Next, add dimensions. (I'm making the dimensions up as I go along.)



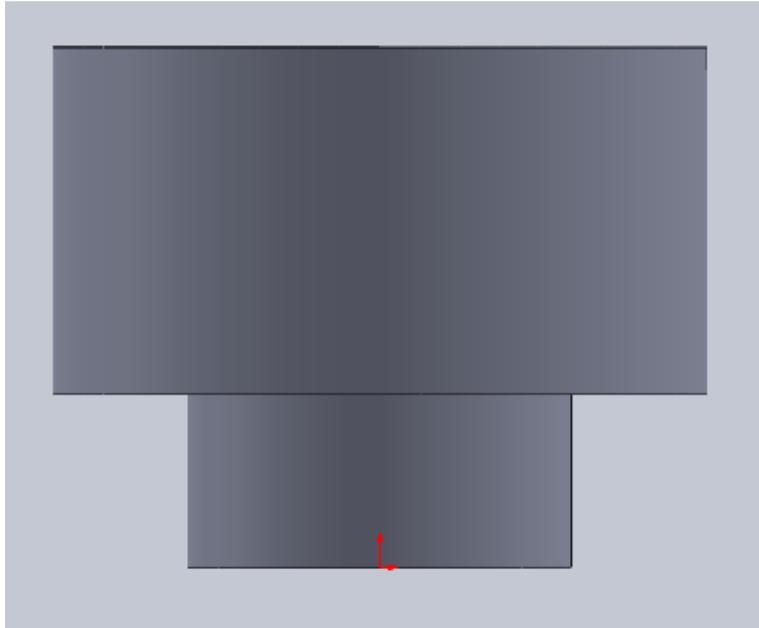
And, revolve into a solid. I know, I know, I didn't put in the fillet radii in the sketch. My preference is to do 3D fillets. IMHO they're more robust.



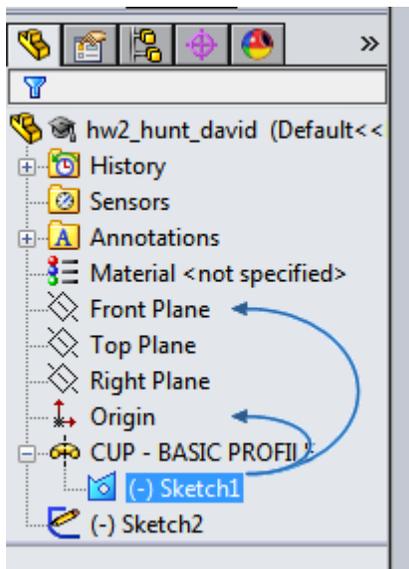
Don't forget to rename the feature!



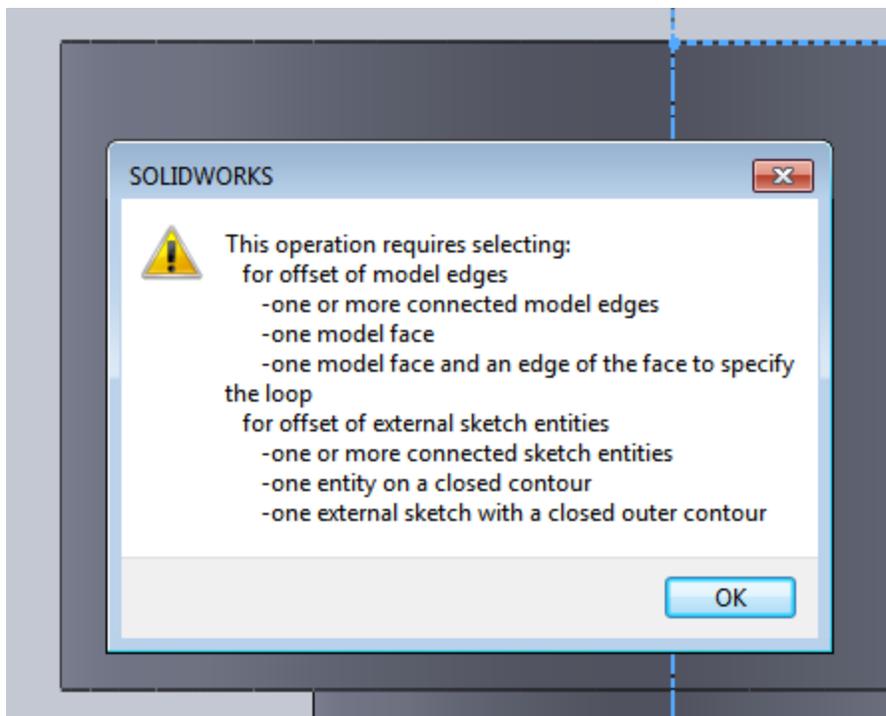
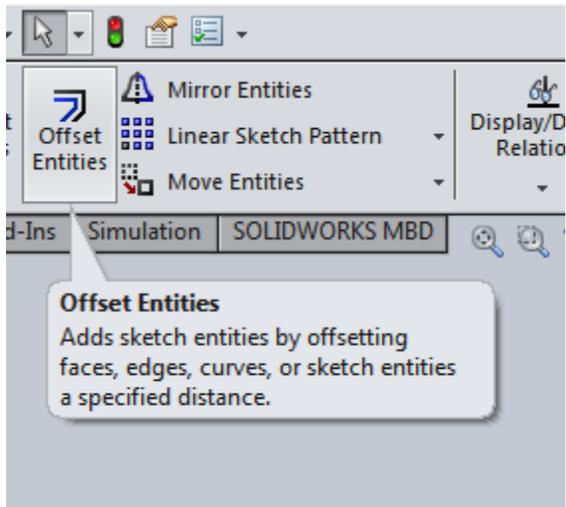
Next, get back into sketch mode for the revolve cut. For this one, I will work – mostly – viewing normal to the plane.



As in the lab and following assignment, open the previous feature and click on the sketch.

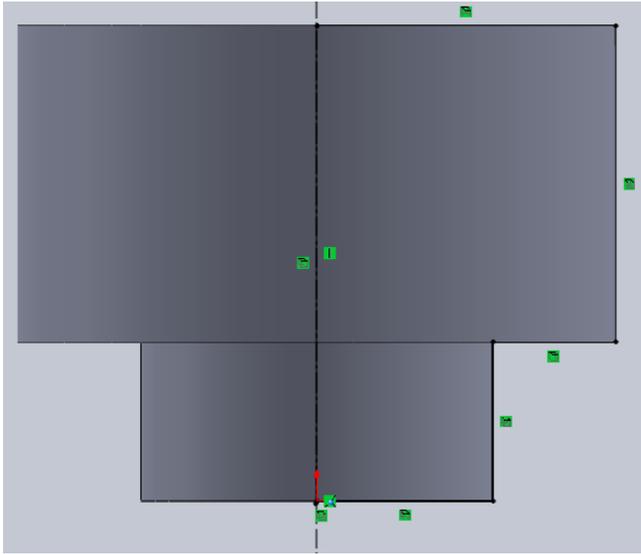


Then click on “Offset Entities”.

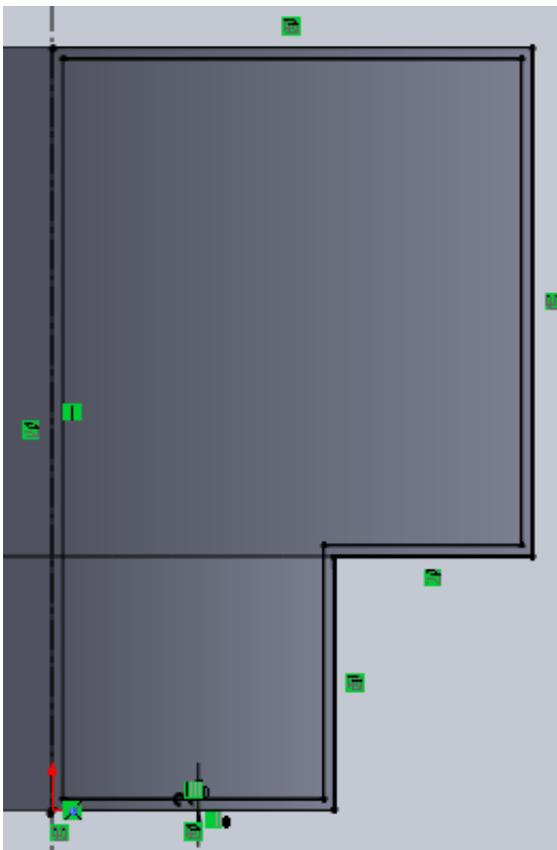


Hmm. Doesn't work for me (interestingly, I tried this on a different computer, and it *did* work like in the lab). Here's an important lesson for CAD: There's almost always more than one way of doing things.

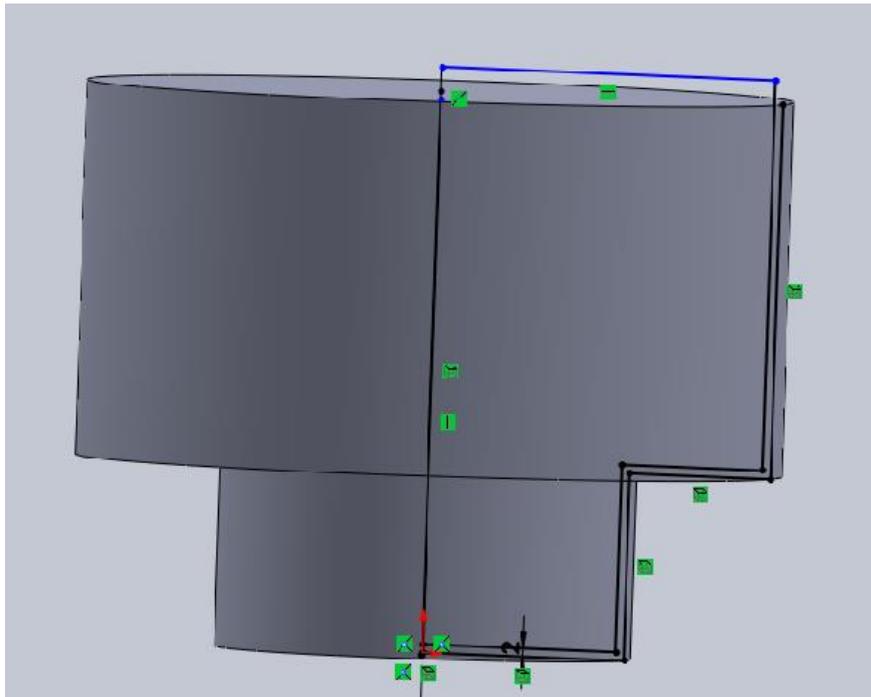
So, here's "another way". In the sketch, highlight the original sketch. Then, press CONVERT ENTITIES.



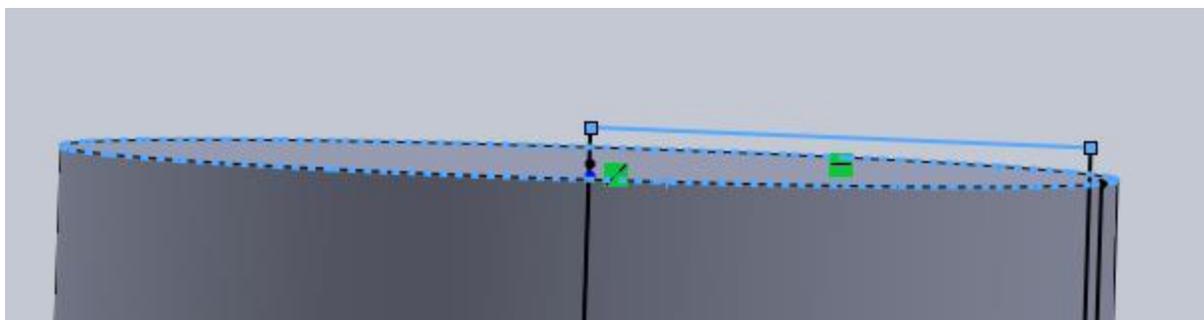
I have now pulled in the lines from the first sketch into this sketch. (Note, I use this in as a part of my standard modeling techniques when I am working to create alignments with pre-existing features to maintain **design intent**.) Then do OFFSET ENTITIES; I used 2 mm.



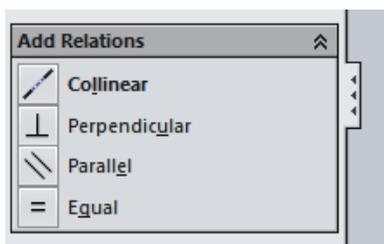
OK, now I need to do some trimming and extending to get the right profile for the rotated cut.



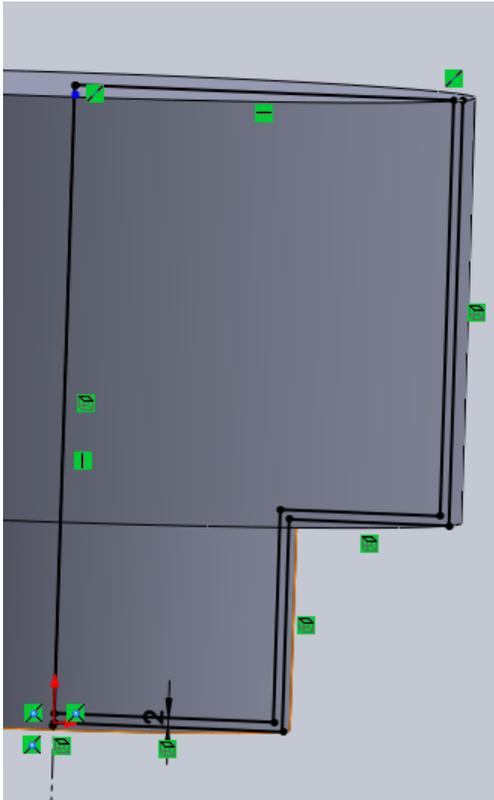
Notice that the top line is *above* the surface of the cup. I could leave that there. Even if it is underdefined, it stands proud of the surface. However, that's *not* a **good modeling practice** – because it does not capture the **design intent** of wanting that cut to always be aligned with that surface. So... highlight that line by clicking on it, then hold down the CTRL key and then click the edge.



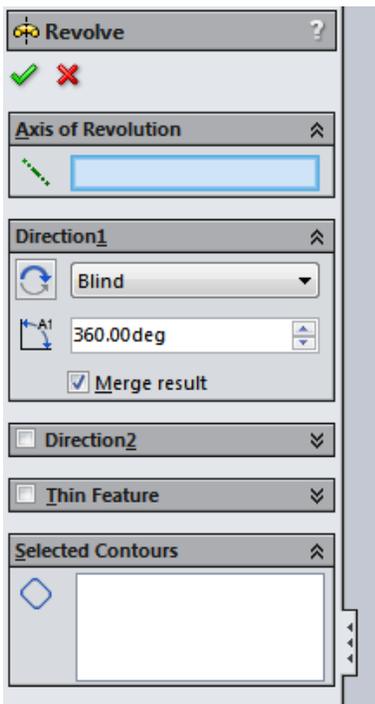
And look at the side bar, and hit COLLINEAR.



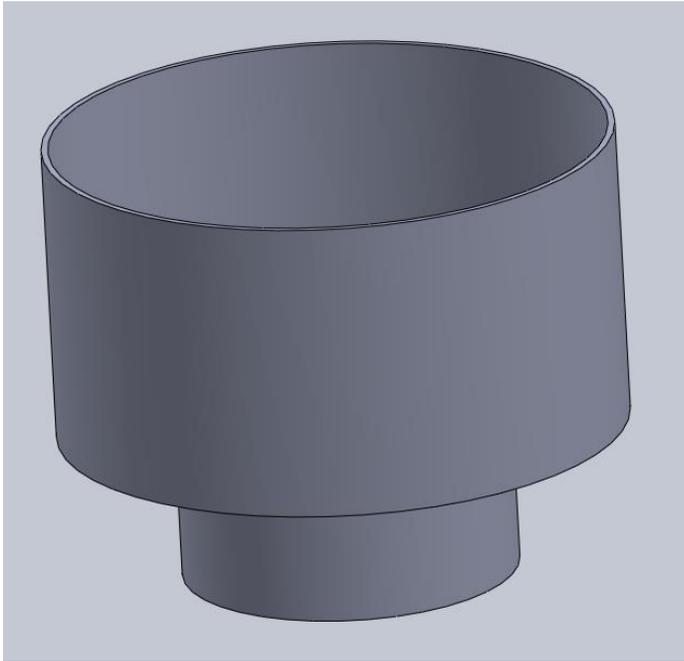
And now the line is aligned with that edge / top surface, capturing my **design intent**.



Now, when I go to do a REVOLVED CUT, notice that it asks me for the axis and the contour to use.

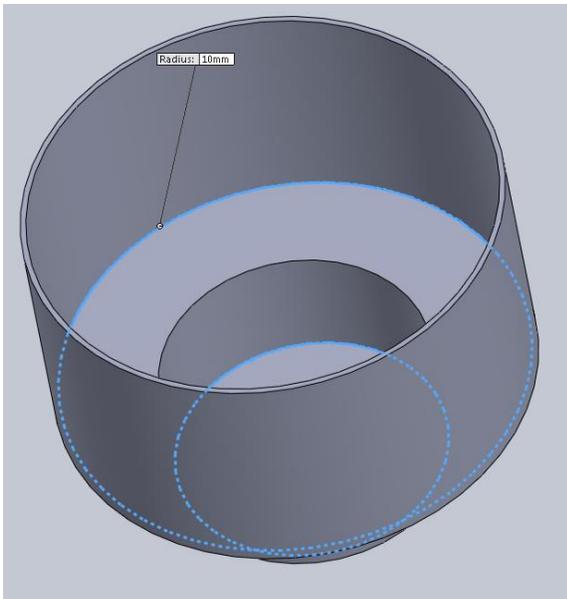


Select the centerline and the inner profile, and then the GREEN CHECK MARK. Don't forget to rename the feature!

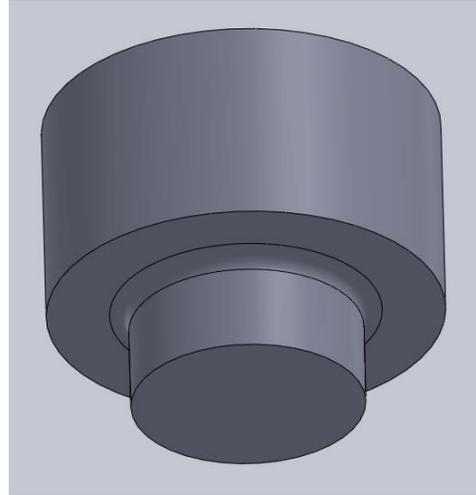
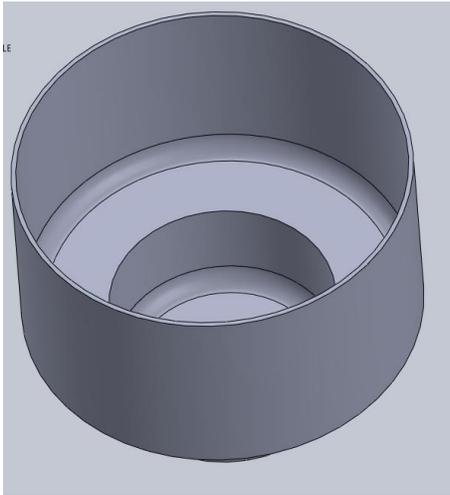


So, not *quite* as elegant as shown in the lab, but... it works to get the job done.

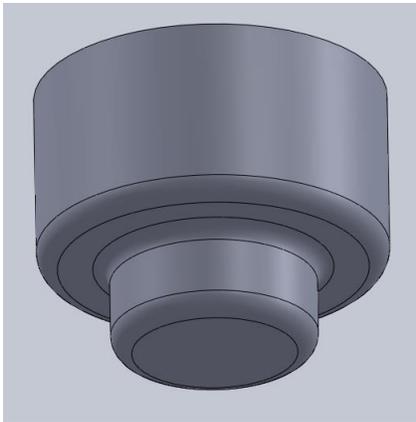
Now, to FILLETS. Always do fillets on the inside wall first. I'll use a radius of 8 mm on the inside. Don't forget, there's another corner on the outside that is an "inside wall".



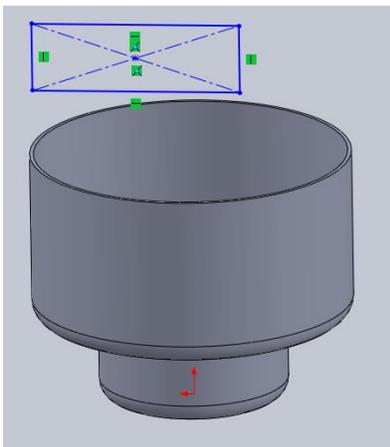
With the results:



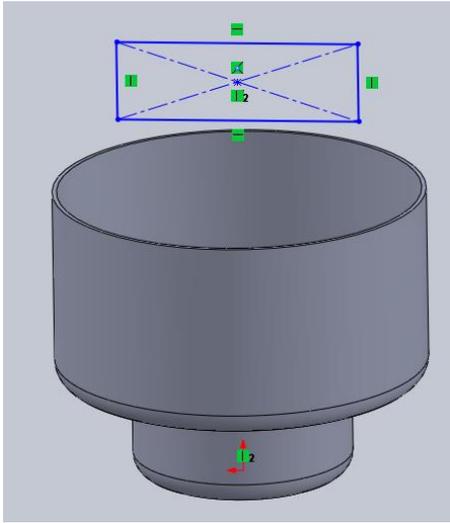
And now do the outside-of-the-corner fillets. Remember – my inner corner radius is 8 mm, plus 2 mm thickness, so the outer radius should be 10 mm. And rename fillets too.



Now to make the handle. I sketch a center-point rectangle, and I do not align it to anything. Nor do I even try.

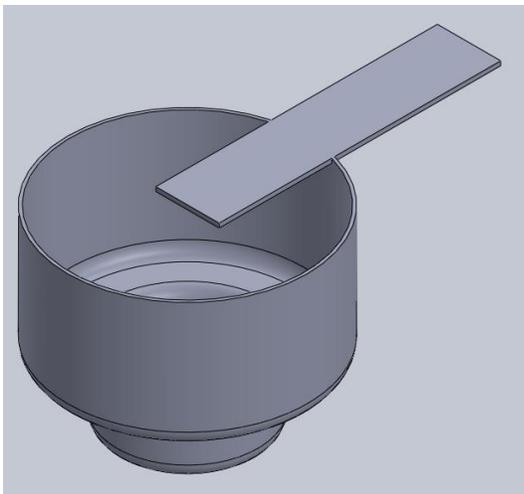


Next, pick the center point of the rectangle, and then hold down CNTL and pick the origin. Then, on the side, pick the VERTICAL constraint. This means they will always be vertical relative to one another.



Now, pick the top edge of the rectangle, and the outer edge of the cup. Why the outer edge? Because several of you picked the inner edge by accident. What that does is create a dependency of the handle on the revolve cut – which means you cannot drag the handle above the cut! Hit COLINEAR.

Make it 45 mm wide and 3 mm thick. And I play with it until I arrive at a length of 200 that “looks right”.



Well, that looks weird! So. Grab the HANDLE feature and drag it up to just before the revolve cut (thus showing that features can be re-ordered, within limits). Then do a couple more fillets, and the edge chamfer.

