# Design 0100, Weekly Design Guide
Week 8, Rotation Items

This week we will build some items using rotation features. The first one will be a tire followed by a wheel for the tire then a cap and eraser for the pencil.
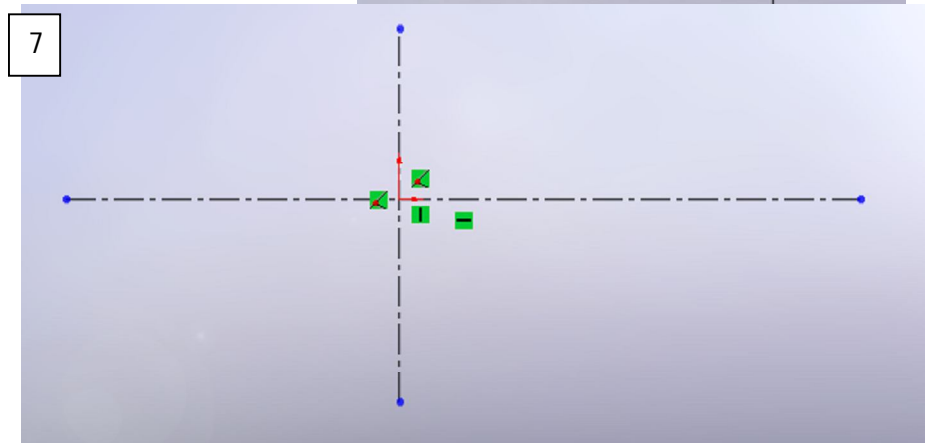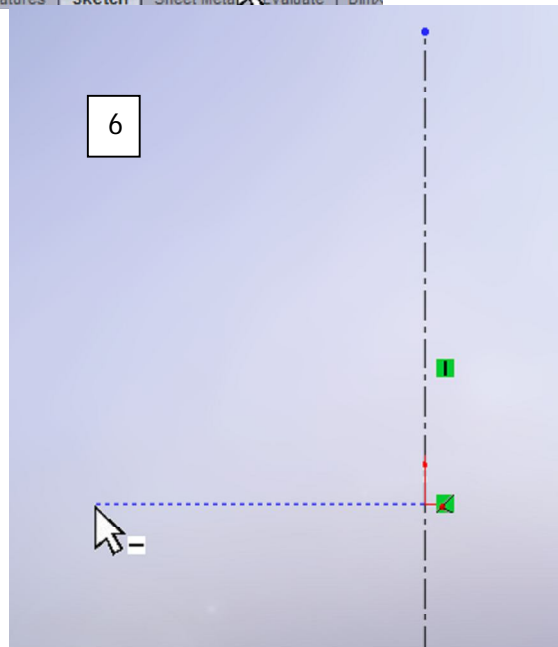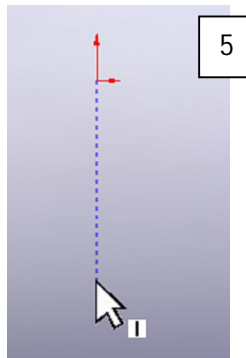
Perform the following steps:

For the Tire open a new document:

1. Choose "New" then press "OK"

2. Select "Part" from the "Templates" tab. Save this part (even before you do any work) to your thumb drive in the Week 7 folder and name it "Tire".

3. To start choose the "Sketch" tab from the "Command Manager"
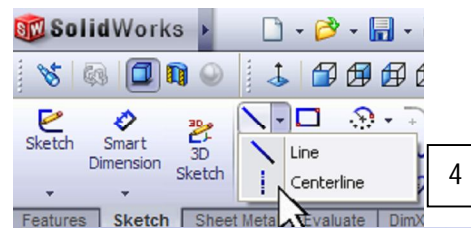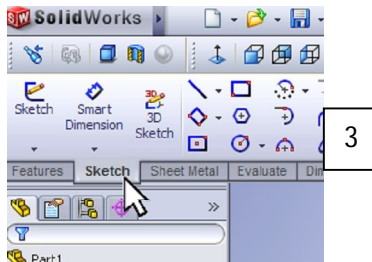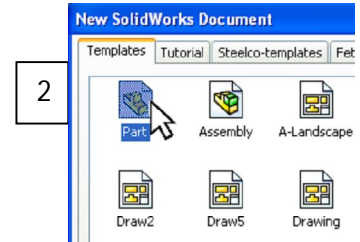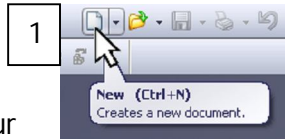
4. Click on the Front Plane first then choose the "Centerline" sketch element on the "Command Manager". Notice that this selection order makes the Front Plane perpendicular to the screen. This will allow for easier sketching.

5. Sketch a vertical centerline from below the origin to above the origin in the approximate location shown. When you start this line below the origin a small dashed line will appear signaling that a "vertical" relation will be established with this line to the origin. Do not make any endpoint relations with the origin.

6. Repeat the above procedure for a horizontal line.

7. The 2 lines should resemble the image below with both lines crossing at the origin. If not see me. The endpoints will be blue still because the lengths of the centerlines have not been defined.
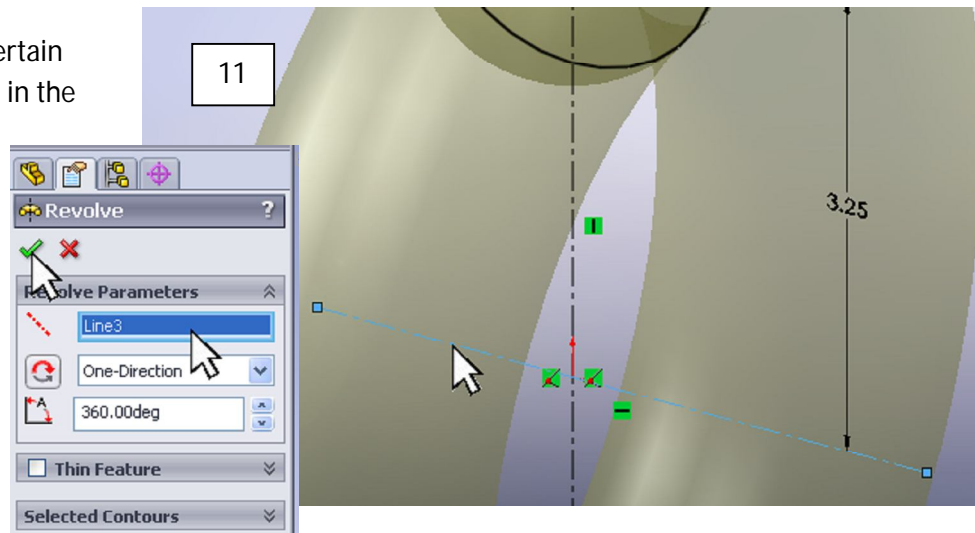
1

8. Draw a circle on the top endpoint of the vertical centerline and "Smart Dimension" it to 2 inches in diameter. We need one more dimension to make this circle fully defined and unable to freely move.

9. Using the "Smart Dimension" make the center of the circle 3.25" from the horizontal centerline. The " symbol refers to inches ' is for feet. Remember to click on the edge of the circle not the center for this dimension.

Ø2.00

8

Ø2.00

9

3.25
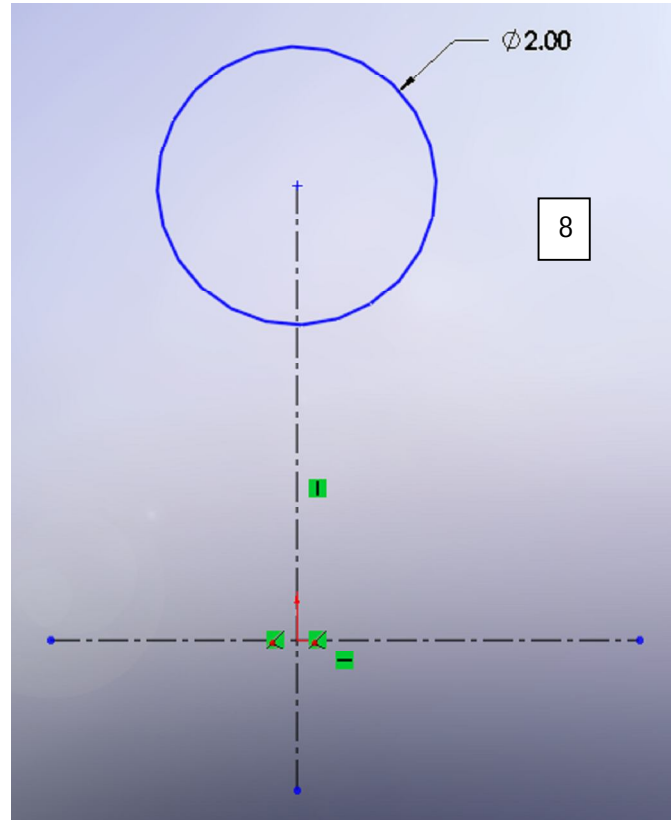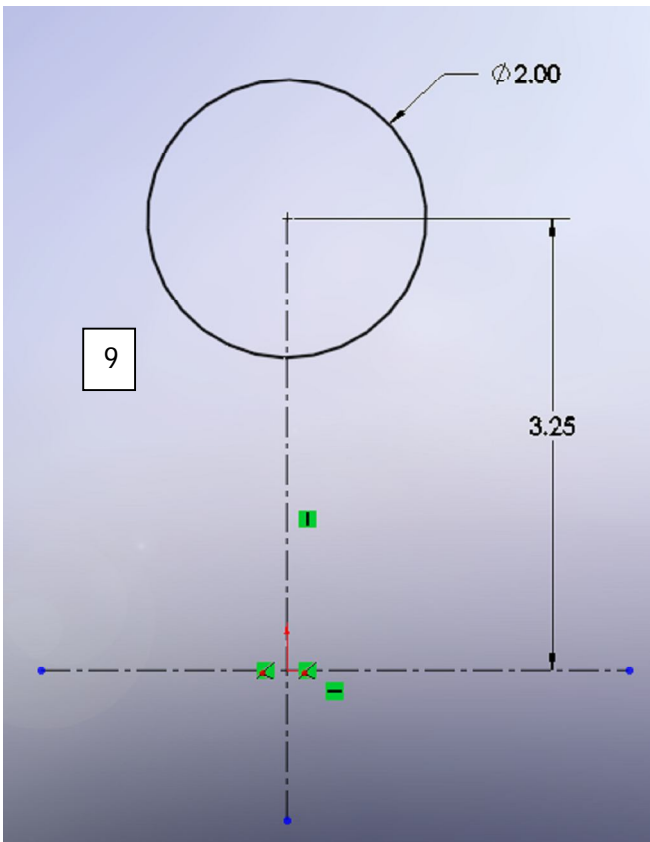
10. Go to the "Command Manager" and select the "Revolved Boss/Base" Feature.

10
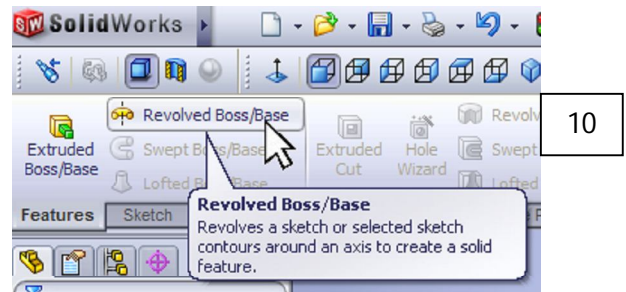
11. Select the horizontal line. Make certain that the horizontal line is selected in the "Properties Manager" as shown. Click the green checkmark.

11

3.25

Revolve

Revolve Parameters

Line3

One-Direction

360.00deg

☐ Thin Feature

Selected Contours

2

12. Assign rubber as the material for your tire.

13. Let's add some treads. Go to your "Feature Manager Design Tree" and right click on "Revolve1". Select the Edit Sketch symbol as shown.

14. Before making modifications go to the "Standard Views" toolbar and select the "Normal To" button as shown. This will orient your sketch so that the line of sight is Normal to the screen (which makes the sketch parallel to the screen. This will make it easier to modify your sketch.

15. Go to the "Command Manager" and select the "Dynamic Mirror Entities" tool then go to the Model Area and select the vertical Centerline. This will allow you to sketch on one side of the vertical Centerline and have the same objects appear on the other side, the same distance and size from the mirrored line.
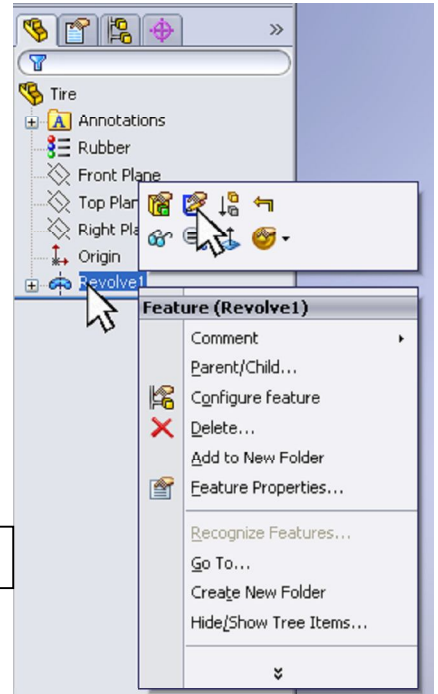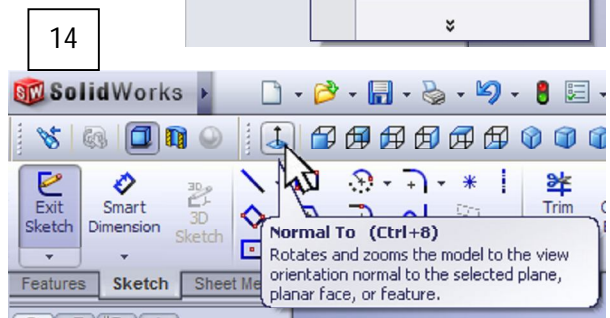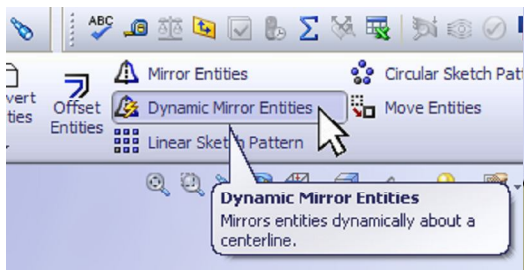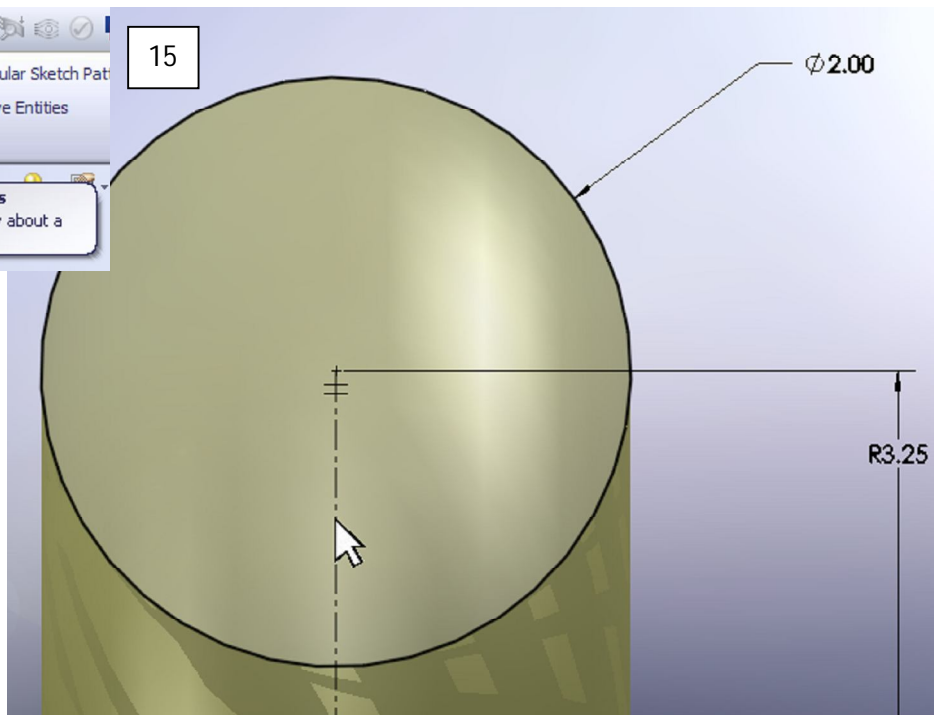
16. Sketch a small circle on the top of the circle that defines the top of the tire. Make certain that you touch the top of the circle of the tire so that you can establish a coincident relation between the circles sketched and the circle of the tire. The circle defining the tire will turn orange.
17. Pull out the circle to a reasonable size.
18. Insert a "Smart Dimension" of 0.40" between the circles. Because of the mirroring entity the two circles will be symmetric about the vertical Centerline and equal in size. Make the circles 0.20 inches in diameter.
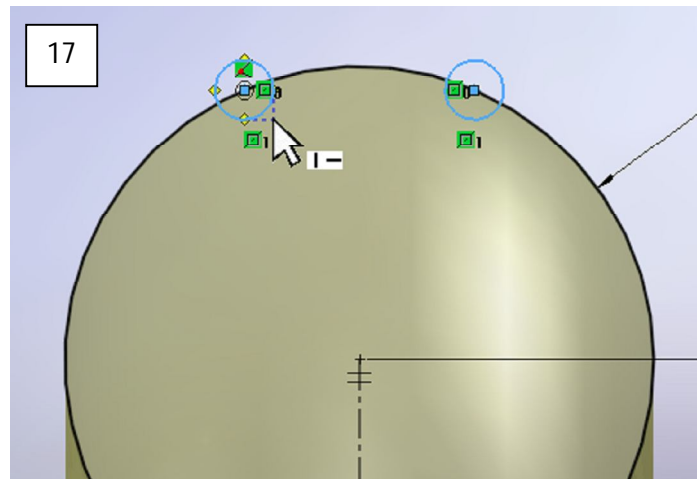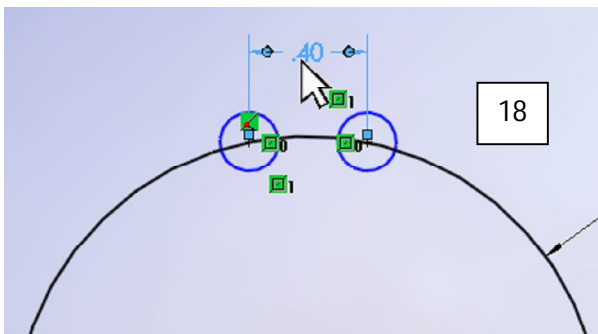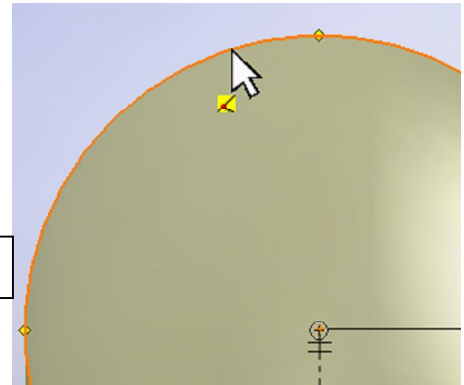
19. Choose the "Trim Entities" button on the "Sketch Tab" of the "Command Manager".
20. Trim out the portions of the circles that are not needed as shown. You can do this by dragging the cursor over any sketch entity that you want to cut out. Do this for both circles.
21. Sketch two more circles in a similar manner as you did the first two with the mirror entities selected. Make these 1.10" apart from each other as shown.
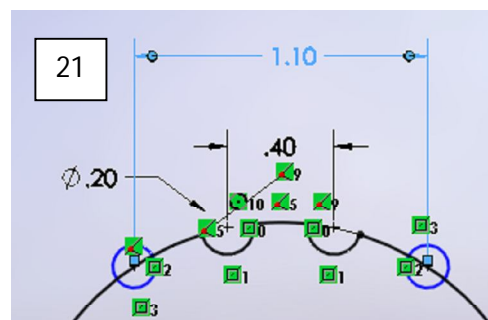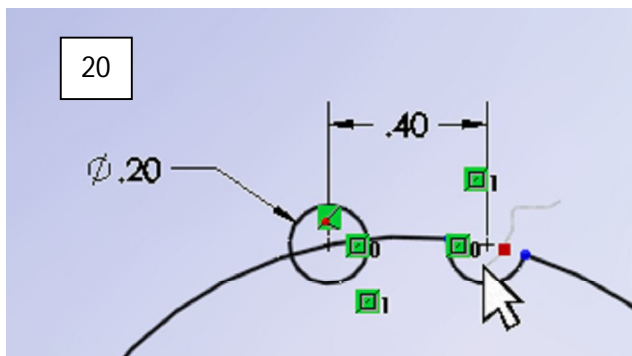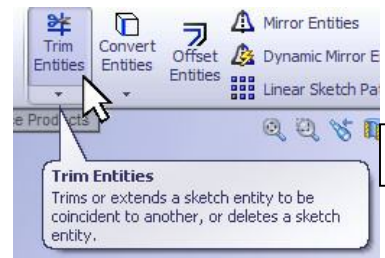
22. Make all of the circles equal by selecting one of the new circles drawn and with the "Ctrl" key depressed click on the portion of one of the other circles drawn. Use the small popup menu or go to the "Properties Manager" and select the "=" button as shown. This will make all the circles equal and fully defined and thus black in the sketch. Trim out the portions of the circles that you do not want as was done above.

23. Click the "Rebuild" button on the Main Menu.

24. Your new Tire should look similar to the one shown below.