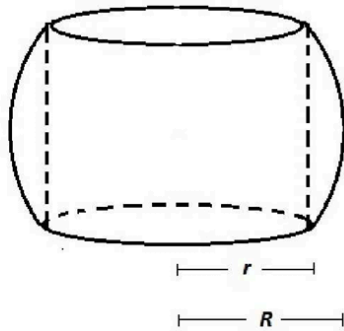


## Volume between a Cylinders and a Sphere

6. (10 points) A manufacturer drills a round hole of radius  $r$  through the center of a metal sphere of radius  $R$ . Find the volume of the remaining metal “bead.”



As you can see this was a problem on our Autumn 2014 final exam in Math 125. Then a version of this problem was in our homework for a while.

The problem was discussed in an [MAA article in 2008](#) and more details can be found on related problems in [this Wikipedia article](#).

We decided to make a print of the situation where the “napkin ring” or “bead” has a volume that is exactly half the volume of the sphere. That is the print you see and the visual in our animation. Can you solve for the radius of the cylinder that makes this happen? Or can you come up your own question about this problem?