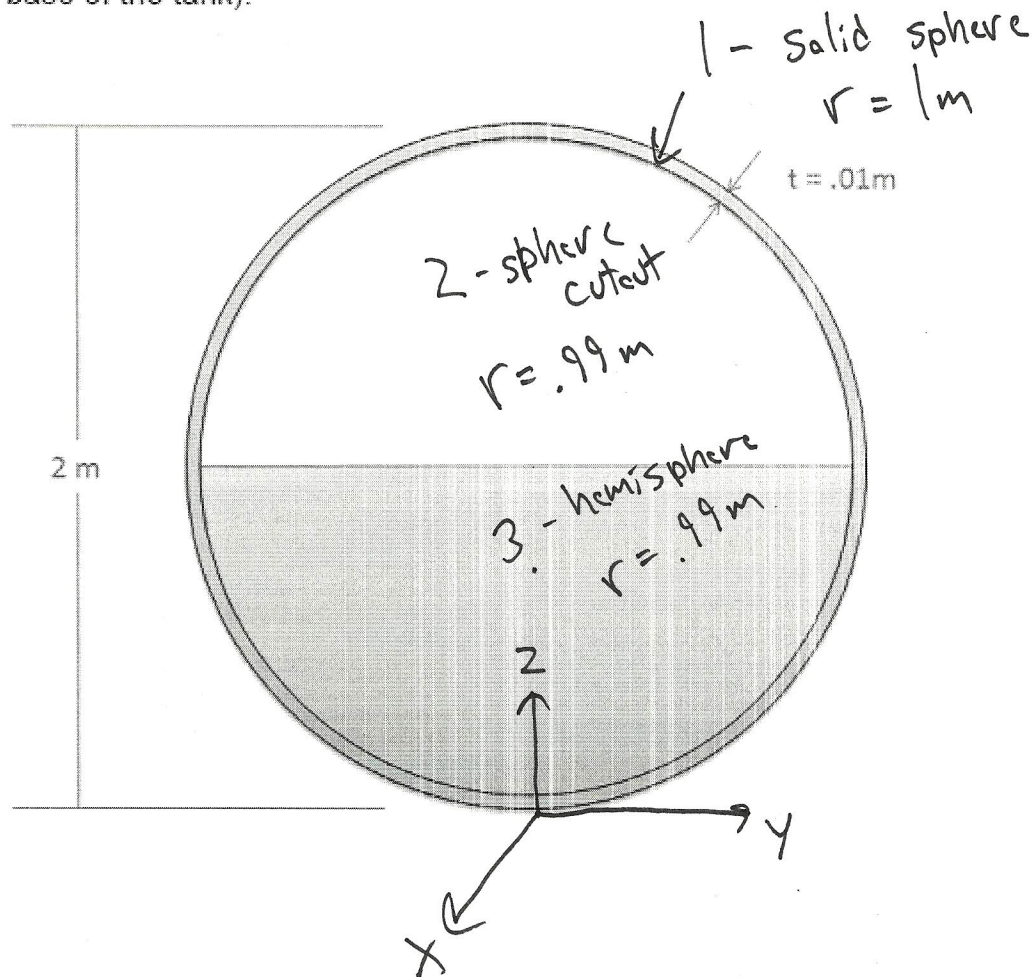


A spherical steel tank (density = 8050 kg/m^3) is half filled with water (density = 1000 kg/m^3) as shown below. Find the overall mass of the tank and the current location of the center of mass of the tank (measured from the base of the tank).



Shape	Volume	density	mass	\bar{x}_i	\bar{y}_i	\bar{z}_i
1	4.189 m^3	8050 kg/m^3	33719.8 kg	0	0	1 m
2	-4.064 m^3	8050 kg/m^3	-32718.3 kg	0	0	1 m
3	2.032 m^3	1000 kg/m^3	2032 kg	0	0	$.629 \text{ m}$

$$1 - \frac{3}{8}(.99)$$

$$m = 3033.5 \text{ kg}$$

$$\bar{X} = 0$$

$$\bar{Y} = 0$$

$$\bar{Z} = \frac{(33719.8)(1) - (32718.3)(1) + (2032)(.629)}{3033.5 \text{ kg}}$$

$$\bar{Z} = .751 \text{ m}$$