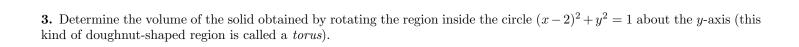
1. We have seen that the integral  $\int_1^\infty \frac{1}{x} dx$  diverges to  $\infty$ . This integral represents the area of a region in  $\mathbb{R}^2$ . What is the volume of the solid obtained by rotating the same region about the x-axis?

2. A water tank has the shape of a sphere with a diameter of 10ft. If the depth of the water in the tank is 7ft, what percent of the tank is being used?



4. Each integral represents the volume of a solid of revolution. Describe the solid (using words or a sketch).

a) 
$$\int_0^2 \frac{2\pi}{1+x^2} \, dx$$

b) 
$$\int_0^{\frac{\pi}{2}} \pi (1 - \sin^2 x) \ dx$$

c) 
$$\pi \int_0^3 (y+1)^2 - (y-1)^4 dy$$