# Problem 1

Find the volume of the solid between the sphere $\rho = \cos(\phi)$ and the upper hemisphere of $\rho = 2$. Draw a picture of this region.

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# Problem 2

Find the center of mass for the region bounded below by $\phi = \frac{\pi}{3}$ and above the function $\rho = 1$ (assume $\delta = 1$). Draw a picture of this region and plot the center of mass.

## Problem 3

Set up the triple integral in cylindrical coordinates for the volume of the region in problem 2 (you don't need to solve this).

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## Problem 4

Find the volume of the solid bounded below by the $xy$-plane, above by the function $\rho = 4$, and on the sides the cylinder $x^2 + y^2 = 1$. As usual, draw a picture of this region.