

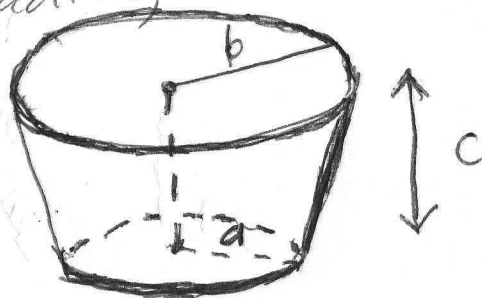
① Let $E = \{(x, y, z) \mid 0 \leq z \leq x+y \text{ \& } r \leq 4\}$. HW37

Find the average x -coordinate in E .

② Find $\iiint_H xy \, dV$ where
 $H = \{(x, y, z) \mid r \leq z \leq \theta \leq \pi\}$.

Hint for ①:
Where $x+y=0$,
what values in $[-\pi, \pi]$
does θ take?

③ Recall the cup from previous homeworks,
a truncated cone. For less confusion with
the coordinate axes, let a be the smaller
radius, b the larger radius, and c the height:



Find an integral of the form
$$\int_{\theta=0}^{\theta=2\pi} \left(\int_{z=\square}^{z=\square} \left(\int_{r=\square}^{r=\square} \square \, dr \right) dz \right) d\theta$$

equal to the volume of the cup.