

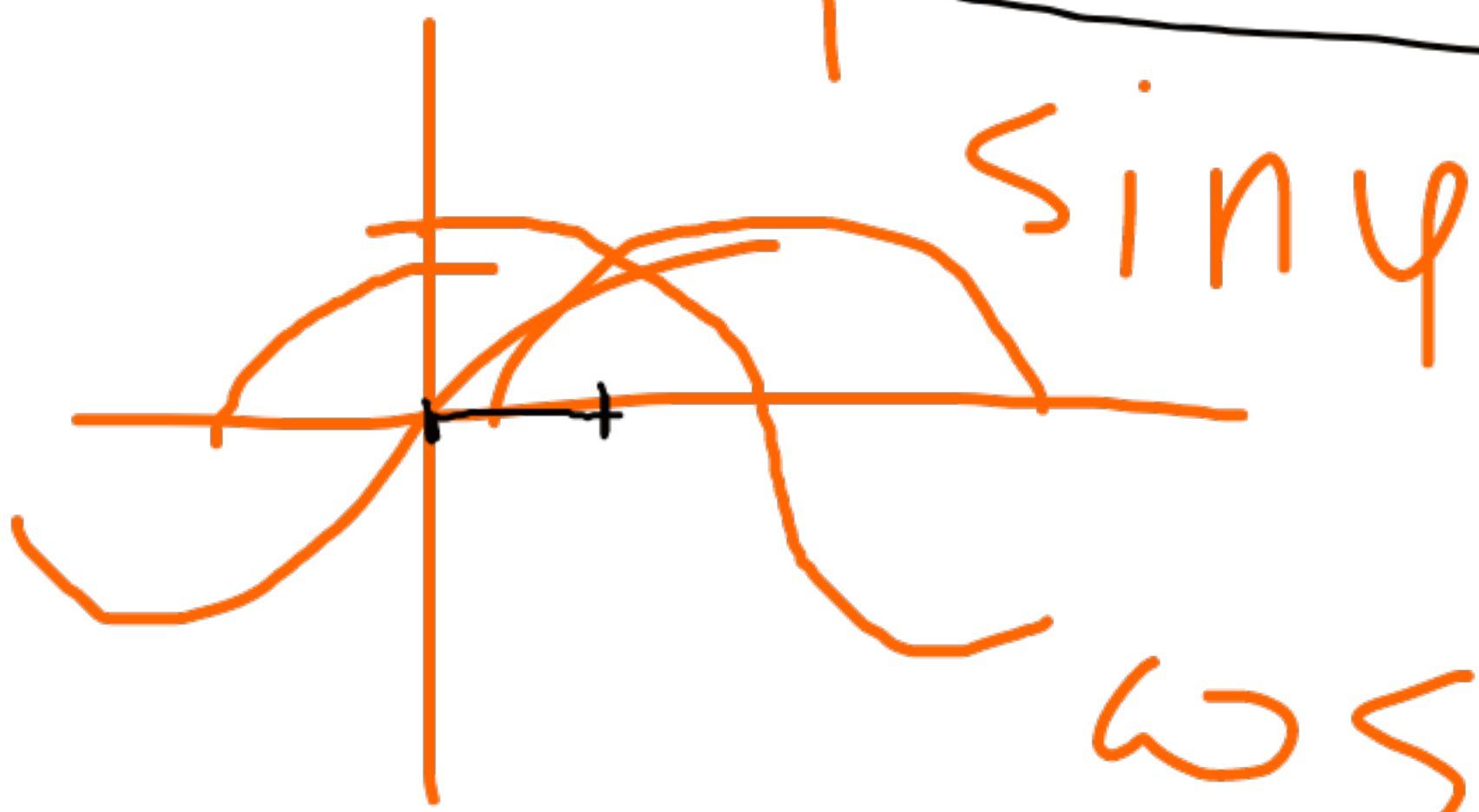
$$\iint_D (x^2 + y^2) dx dy$$

$$D = \{0 \leq y \leq x^2 + y^2 \leq x\}$$

$$\begin{cases} x = r \cos \varphi \\ y = r \sin \varphi \end{cases} \quad (r \geq 0)$$

$$0 \leq r \sin \varphi \leq r^2 \leq r \cos \varphi$$

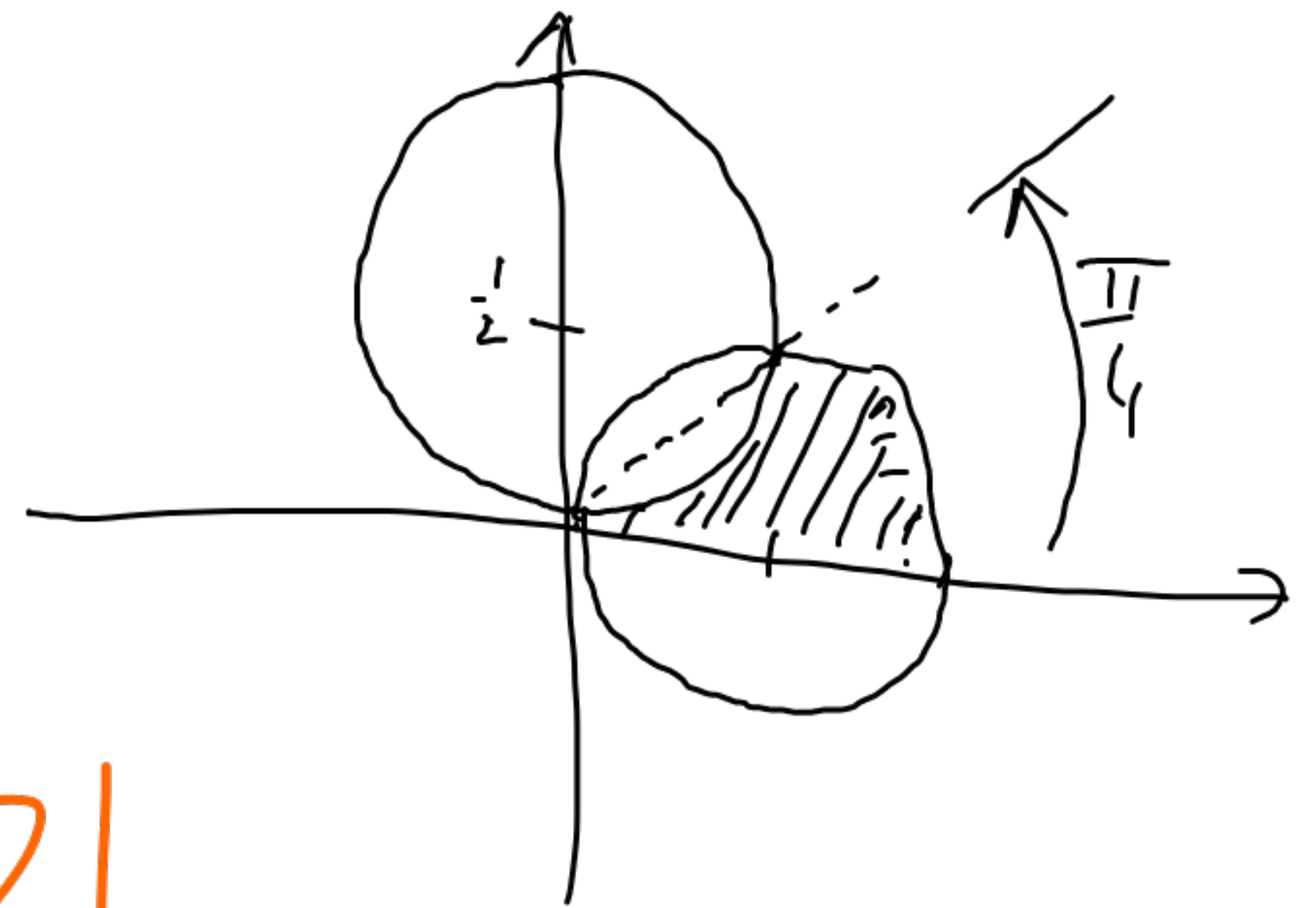
$$0 \leq \sin \varphi \leq r \leq \cos \varphi$$



$$r \in [\sin \varphi, \cos \varphi]$$

$$\varphi \in \left[0, \frac{\pi}{4}\right]$$

$$\int_0^{\pi/4} \int_{\sin \varphi}^{\cos \varphi} r^2 dr d\varphi$$



$$= \int_0^{\pi/4} \frac{\cos^4 \varphi - \sin^4 \varphi}{4} d\varphi$$