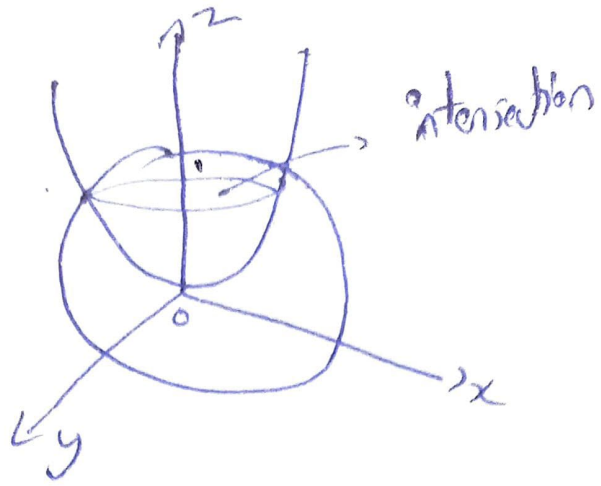
$$\text{Volume} = \iint_A \int_{z=0}^{\sqrt{4-x^2-y^2}} dz\, dA$$



A: intersection plane of $x^2+y^2+z^2=4$ & $x^2+y^2=3z$

$\Rightarrow$ $z^2+3z-4=0$

$(z+4)(z-1)=0 \Rightarrow z=1,-4$

Thus A is $x^2+y^2=3$

$$\text{Volume} = \iint_A \sqrt{4-x^2-y^2}\, dA$$

A: $x^2+y^2=3$

Converting to polar

$$= \int_{\theta=0}^{2\pi} \int_{r=0}^{\sqrt{3}} \sqrt{4-r^2} \times r\, dr\, d\theta$$

$\Rightarrow$ $2\pi \times \int_{r=0}^{\sqrt{3}} \sqrt{t} \times r \frac{dt}{-2r}$ $\left(4-r^2=t \Rightarrow \frac{dt}{dr}=-2r\right)$ $\Rightarrow -\pi \frac{2}{3}\left[(4-r^2)^{3/2}\right]_0^{\sqrt{3}}$

$\Rightarrow -\frac{2\pi}{3}[1-8] \Rightarrow \boxed{\frac{14\pi}{3}}$ Ans