

$$\iiint_V (x^2 + y^2 + z^3) \mathbf{n} \, dS$$

use divergence theorem

$$\iiint_V \nabla \cdot (x^2 + y^2 + z^3) \, dV$$

$$\Rightarrow \int_A \int_{z=0}^{z=1} (2 + 3z^2) \, dz \, dxdy$$

$$A: x^2 + y^2 = 1$$

$$\Rightarrow \iint_A [2z + z^3]_0^1 \, dA$$

$$\Rightarrow \iint_A (2 + 1) \, dA \Rightarrow 3 \iint_A dA$$

$$\Rightarrow 3 \times \pi(1)^2 = \boxed{3\pi}$$