

$$A: x^2 + y^2 + z^2 \leq 5 \equiv \text{SFERA RAGGIO}=2$$

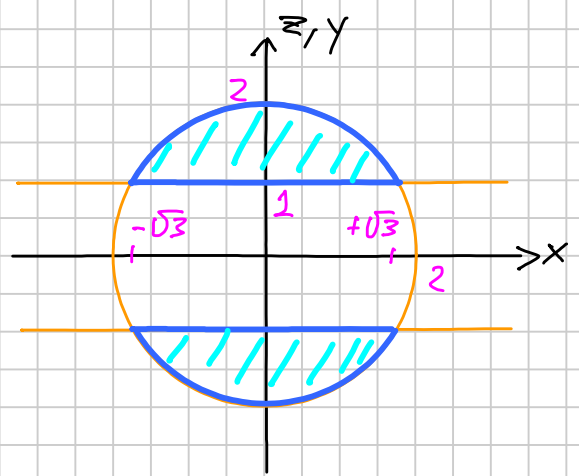
$$B: y^2 + z^2 \geq 1 \equiv \text{CILINDRO}$$

MODO 1 - CALCOLO DIRETTO

$$V = \int_{-\sqrt{3}}^{\sqrt{3}} \int_1^{\sqrt{5-x^2}} 2\pi y \, dy \, dx =$$

$$= 2\pi \int_{-\sqrt{3}}^{\sqrt{3}} \left[ \frac{y^2}{2} \right]_1^{\sqrt{5-x^2}} dx = \pi \int_{-\sqrt{3}}^{\sqrt{3}} (5-x^2-1) dx = 2\pi \int_0^{\sqrt{3}} (3-x^2) dx =$$

$$= 2\pi \left[ 3x - \frac{x^3}{3} \right]_0^{\sqrt{3}} = 2\pi \left( 3\sqrt{3} - \frac{3\sqrt{3}}{3} \right) = 4\pi\sqrt{3}$$



MODO 2

$$V = V_1 - V_2 - 2V_3$$

$$\begin{cases} V_1 = \frac{4}{3}\pi R^3 = \frac{32}{3}\pi \quad (\text{SFERA}) \\ V_2 = \pi R^2 \cdot H = \pi \cdot 1^2 \cdot 2\sqrt{3} = 2\sqrt{3}\pi \quad (\text{CILINDRO}) \\ V_3 = \pi R^2 \left( R - \frac{h}{3} \right) = \pi (2-\sqrt{3})^2 \left( 2 - \frac{2-\sqrt{3}}{3} \right) = \end{cases}$$

$$= \pi (7-5\sqrt{3}) \cdot \frac{1}{3} (5+\sqrt{3}) = \frac{\pi}{3} (28-3\sqrt{3}-12) = \frac{16}{3}\pi - 3\sqrt{3}\pi$$

$$V = \cancel{\frac{32}{3}\pi} - 2\sqrt{3}\pi - \cancel{\frac{32}{3}\pi} + 6\sqrt{3}\pi = 4\sqrt{3}\pi$$

