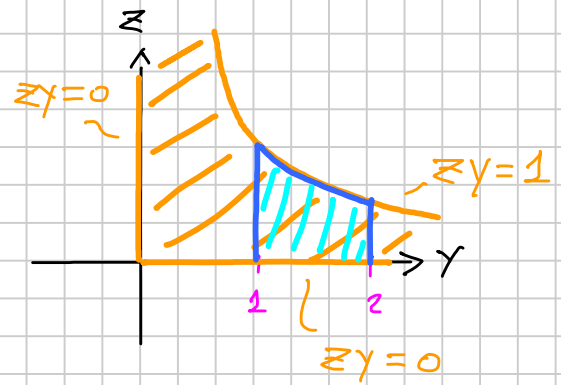


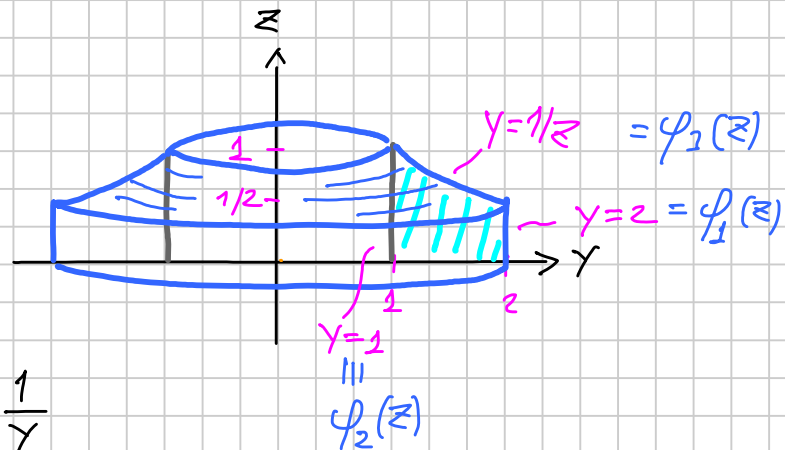
VOLUME SOLIDO DI ROTAZIONE:

$$1 \leq y \leq 2 \quad 0 \leq zy \leq 1$$

ROTAZIONE ATTORNO ASSE Z

$$V = \int_0^{1/2} [\pi \varphi_1(z)^2 - \pi \varphi_2(z)^2] dz + \int_{1/2}^1 [\pi \varphi_3(z)^2 - \pi \varphi_2(z)^2] dz$$

$$\varphi_1(z) = 2 \quad \varphi_2(z) = 1 \quad \varphi_3(z) = \frac{1}{y}$$



$$V = \pi \int_0^{1/2} (4 - 1) dz + \pi \int_{1/2}^1 \left(\frac{1}{y^2} - 1 \right) dz = 3\pi \cdot \frac{1}{2} + \pi \left[-\frac{1}{y} - y \right]_{1/2}^1 =$$

$$= \frac{3}{2}\pi + \pi \left(-1 - 1 + 2 + \frac{1}{2} \right) = \frac{3}{2}\pi + \frac{\pi}{2} = 2\pi$$

VERIFICA CON GULDINO

$$AREA = \int_1^2 \frac{1}{y} dy = [\ln y]_1^2 = \ln 2$$

$$y_G = \frac{\int_1^2 \frac{1}{y} \cdot y dy}{AREA} = \frac{1}{\ln 2}$$

$$V = 2\pi \cdot y_G \cdot AREA = 2\pi \cdot \frac{1}{\ln 2} \cdot \ln 2 = 2\pi$$