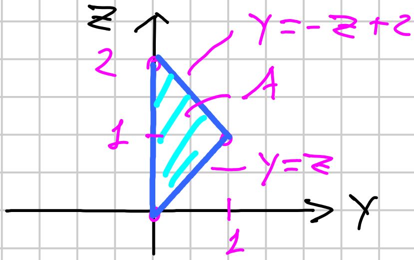
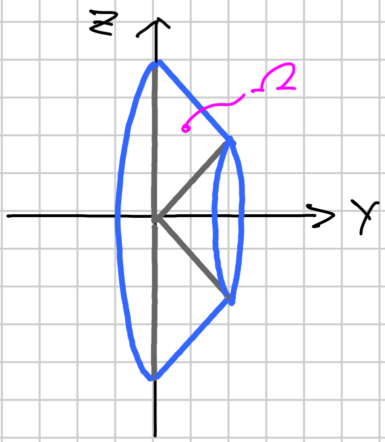
$$\begin{cases} \text{PIANO } yz \\ \text{TRIANGOLO}: (0,0),\ (1,1),\ (0,2) \end{cases}$$



$$y_G = \frac{1}{V}\int_\Omega y\, dx\, dy\, dz$$



CALCOLO DEL VOLUME DI Ω

MODO 1 : COORD. CILINDRICHE $\begin{cases} y = y \\ x = \rho\cos\theta \\ z = \rho\sin\theta \end{cases}$

$$V = \int_\Omega dx\, dy\, dz = \int_0^1 \int_0^{2\pi} \int_y^{2-y} \rho\, d\rho\, d\theta\, dy =$$

$$= 2\pi \int_0^1 \int_y^{2-y} \rho\, d\rho\, dy = \pi \int_0^1 \left[\rho^2\right]_y^{2-y} dy = \pi \int_0^1 \left(4 + \cancel{y^2} - 4y - \cancel{y^2}\right) dy =$$

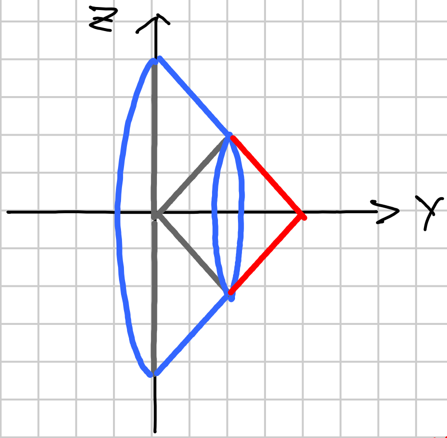
$$= \pi \int_0^1 (4 - 4y)\, dy = \pi \left[4y - 2y^2\right]_0^1 = \pi(4-2) = 2\pi$$

MODO 2 : GULDINO

$$V = 2\pi \cdot z_G(A) = 2\pi \cdot 1 = 2\pi$$

MODO 3 : VOLUME DEL CONO $\frac{1}{3}$ AREA BASE $\times$ H

$$V = V_1 - 2V_2 = \frac{1}{3}(4\pi)\cdot 2 - 2\,\frac{1}{3}\pi\cdot 1 =$$



$$= \frac{8}{3}\pi - \frac{2}{3}\pi = \frac{6}{3}\pi = 2\pi$$

CALCOLO DI Y_G

MODO 1 : COORD. CILINDRICHE $\begin{cases} y = y \\ x = \rho\cos\theta \\ z = \rho\sin\theta \end{cases}$

$$V = \int_\Omega y \, dx\, dy\, dz = \int_0^1 \int_0^{2\pi} \int_y^{2-y} y\rho \, d\rho\, d\theta\, dy =$$

$$= 2\pi \int_0^1 \int_y^{2-y} y\rho\, d\rho\, dy = \pi \int_0^1 y \left[\rho^2\right]_y^{2-y} dy = \pi \int_0^1 (4y - 4y^2)\, dy =$$

$$= \pi \left[2y^2 - \frac{4}{3}y^3\right]_0^1 = \pi\left(2 - 4/3\right) = \frac{2\pi}{3}$$

$$\rightsquigarrow \; Y_G = \frac{1}{2\pi} \cdot \frac{2\pi}{3} = \frac{1}{3}$$

MODO 2 : BARICENTRO DEL CONO $Y_G = \frac{1}{4} H$

$$Y_G \cdot V = Y_{G,1} V_1 - 2\, Y_{G,2} V_2 = \frac{2}{4} \cdot \frac{8}{3}\pi - 2 \cdot 1 \cdot \frac{1}{3}\pi =$$

$$= \frac{4}{3}\pi - \frac{2}{3}\pi = \frac{2}{3}\pi \quad \rightsquigarrow \; Y_G = \frac{1}{3}$$