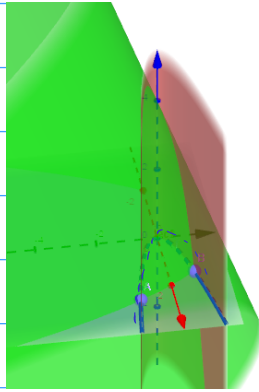
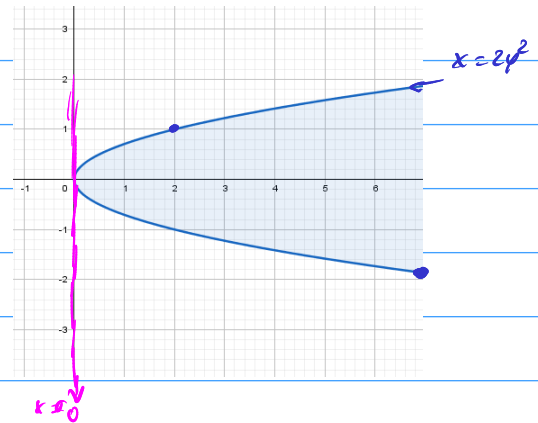


### Pregunta 5

$$2y^2 = x, \quad z = 0, \quad x + 2y + z = 4$$



Proyección en  $xy$



Necesitamos los cortes cuando  $z = 0$

$$x + 2y = 4, \quad 2y^2 = x$$

$$2y^2 + 2y - 4 = 0 \Rightarrow y_1 = 1, \quad y_2 = -2$$

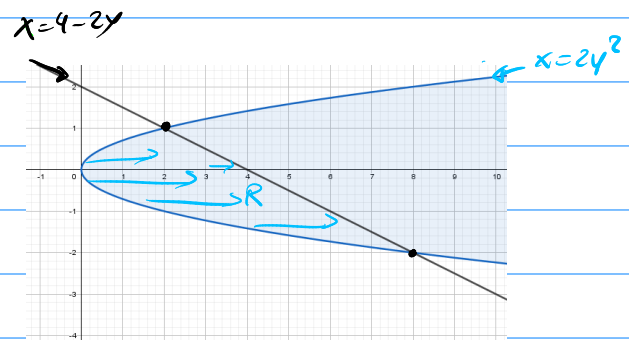
$$\text{despejamos la } z \Rightarrow \begin{cases} z = 4 - x - 2y \\ z = 0 \end{cases}$$

La región en el plano  $xy$

$$2y^2 \leq x \leq 4 - 2y$$

$$-2 \leq y \leq 1$$

$$0 \leq z \leq 4 - x - 2y$$



$$\Rightarrow V = \int_{-2}^1 \int_{2y^2}^{4-2y} \int_0^{4-x-2y} dz dx dy$$

$$V = \int_{-2}^1 \int_{2y^2}^{4-2y} (4 - x - 2y) dx dy$$

$$V = \int_{-2}^1 \left( 4x - \frac{x^2}{2} - 2yx \right) \Big|_{2y^2}^{4-2y} dy$$

$$V = \int_{-2}^1 \left( 4(4-2y) - \frac{(4-2y)^2}{2} - 2y(4-2y) \right) - \left( 4 \cdot 2y^2 - \frac{(2y)^2}{2} - 2y(2y^2) \right) dy$$

$$V = \int_{-2}^1 \left( 2y^4 + 4y^3 - 4y^2 - 6y - \frac{(-2y+4)^2}{2} + 16 \right) dy$$

$$V = \frac{81}{5} = 16,2 \text{ m}^3$$