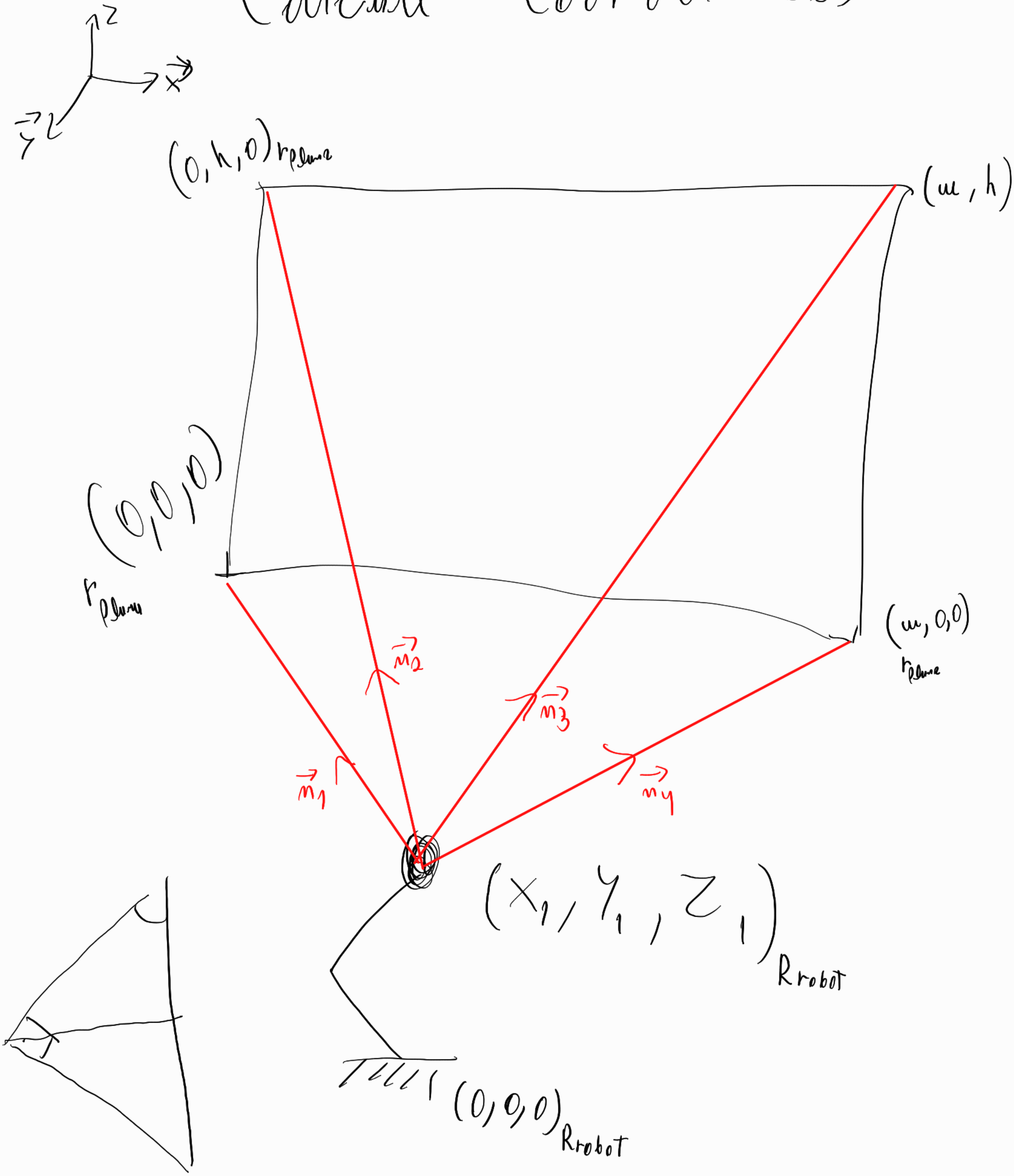
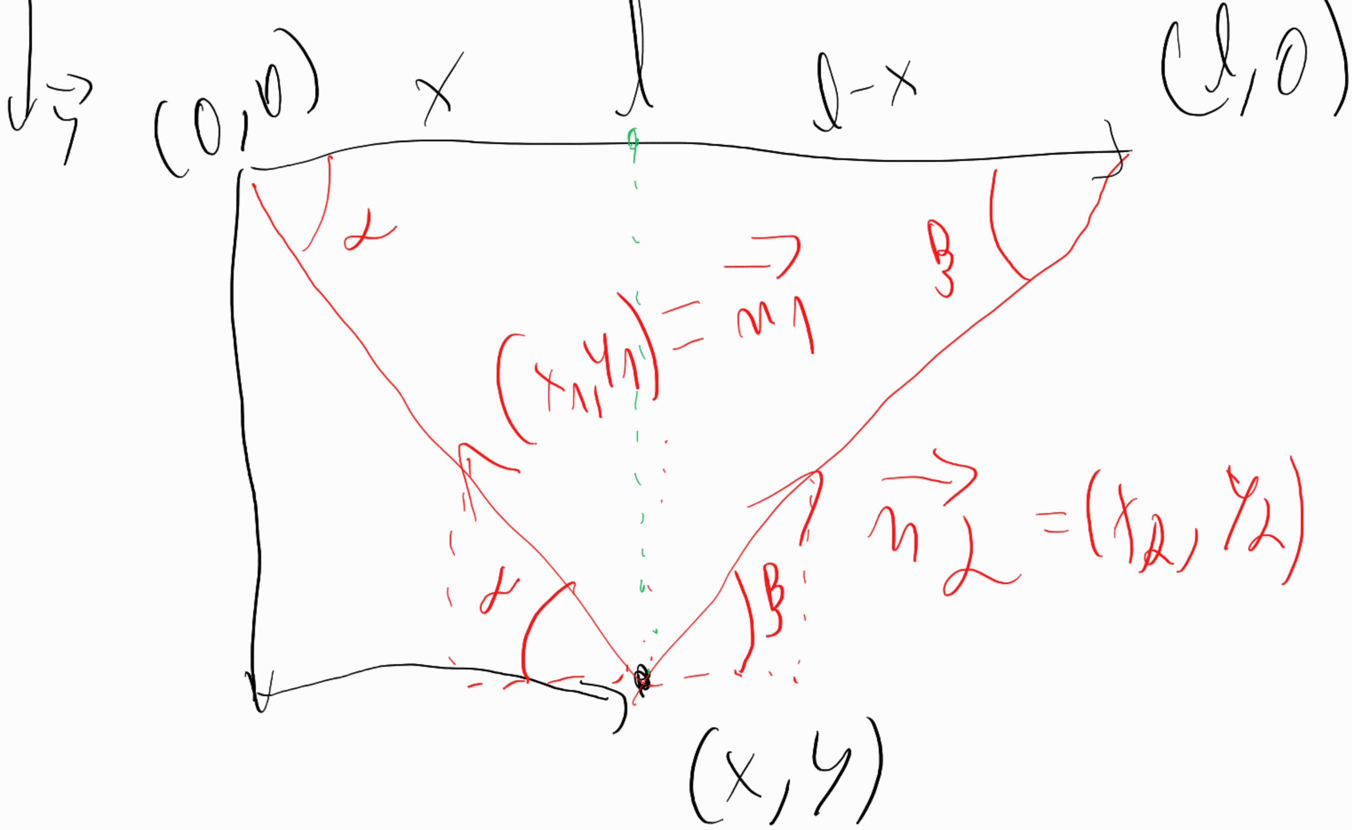
# Calcule Coordonnées




# Simplification 2D




$$\sin\alpha_2 \cdot x = \sin \beta_2 \,(l-x)$$

$$y = \cos\alpha \cdot x = \cos\beta \cdot (l-x)$$

$P_1 = (0,0)$ $\qquad$ $P_p = (x,y)$

$P_2 = (l,0)$

$$\vec{m_1} = \frac{\overrightarrow{(P_1 - P_p)}}{\| P_1 - P_p \|} \qquad \vec{m_1} = \frac{-\overrightarrow{(x,y)}}{\sqrt{x^2+y^2}}$$

$$\vec{n_2} = \frac{(P_2 - P_0)}{\| P_2 - P_0 \|} \qquad \vec{n_2} = \frac{-(x-l, y)}{\sqrt{(x-l)^2 + y^2}}$$

$n_{1x}$ $\quad n_{2y}$

$$\vec{n_1} \cdot \sqrt{x^2+y^2} = -\overrightarrow{(x, y)}$$

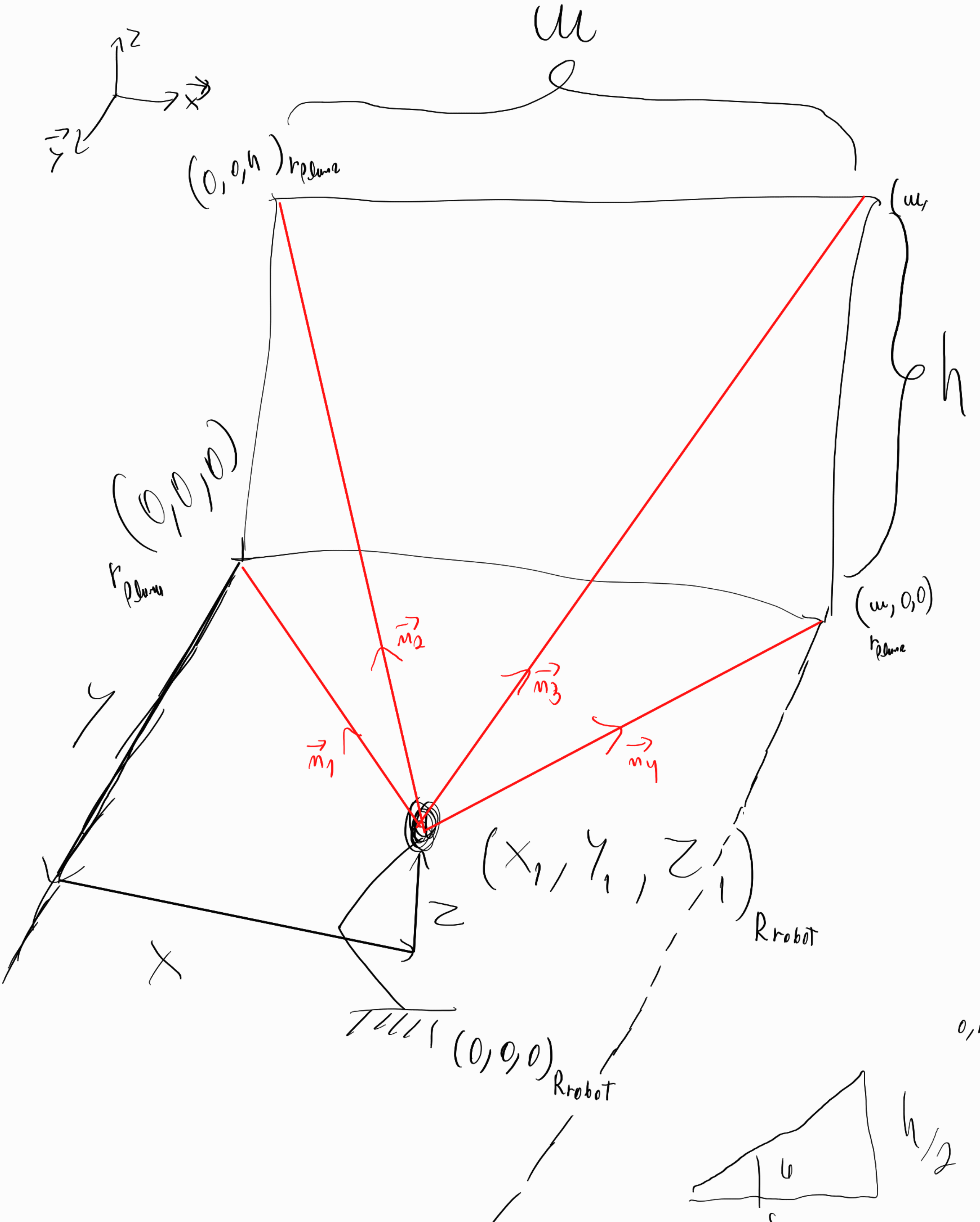
$$\vec{n_2} \cdot \sqrt{(x-l)^2+y^2} = -\overrightarrow{(x-l, y)}$$

Choix des Eq.

$$\begin{cases} n_{1y} \cdot \sqrt{x^2+y^2} = -y \\ n_{2x} \cdot \sqrt{(x-l)^2+y^2} - l = -x \end{cases}$$

fsolve()

Cos 3D



$P_1 = (0,0,0) \quad P_3 = (w,0,h) \qquad P_p = (x,y,z)$

$P_2 = (0,0,h) \quad P_4 = (w,0,0)$

$$\vec{n}_1 = \frac{\overrightarrow{(P_1 - P_p)}}{\|\overrightarrow{P_1 - P_p}\|} \qquad \vec{n}_1 = \frac{-\overrightarrow{(x,y,z)}}{\sqrt{x^2+y^2+z^2}}$$

$$\vec{n}_2 = \frac{\overrightarrow{(P_2 - P_p)}}{\|\overrightarrow{P_2 - P_p}\|} \qquad \vec{n}_2 = \frac{-\overrightarrow{(x,y,z-h)}}{\sqrt{x^2+y^2+(z-h)^2}}$$

$$\vec{n}_3 = \frac{\overrightarrow{(P_3 - P_p)}}{\|\overrightarrow{P_3 - P_p}\|} \qquad \vec{n}_3 = \frac{-\overrightarrow{(x-w,y,z-h)}}{\sqrt{(x-w)^2+y^2+(z-h)^2}}$$

$$\vec{n}_4 = \frac{\overrightarrow{(P_4 - P_p)}}{\quad} \qquad \vec{n}_4 = \frac{-\overrightarrow{(x-w,y,z)}}{\quad}$$

$$\|P_4 - P_p\| \qquad \sqrt{(x-w)^2+y^2+z^2}$$

$$\begin{cases} \vec{n_1} \cdot \|\overrightarrow{P_1 - P_p}\| + (x, y, z) = 0 \\ \vec{n_2} \cdot \|P_2 - P_p\| + (x, y, z-h) = 0 \\ \vec{n_3} \cdot \|P_3 - P_p\| + (x-w, y, z-h) = 0 \\ \vec{n_4} \cdot \|P_4 - P_p\| + (x-w, y, z) = 0 \end{cases}$$

Choix des eq.

$$\begin{cases} n_{1y} \cdot \sqrt{x^2+y^2+z^2} + y = 0 \\ n_{2z} \cdot \sqrt{x^2+y^2+(z-h)^2} + z - h = 0 \\ n_{3x} \cdot \sqrt{(x-w)^2+y^2+(z-h)^2} + x - w = 0 \end{cases}$$

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$v_2()$