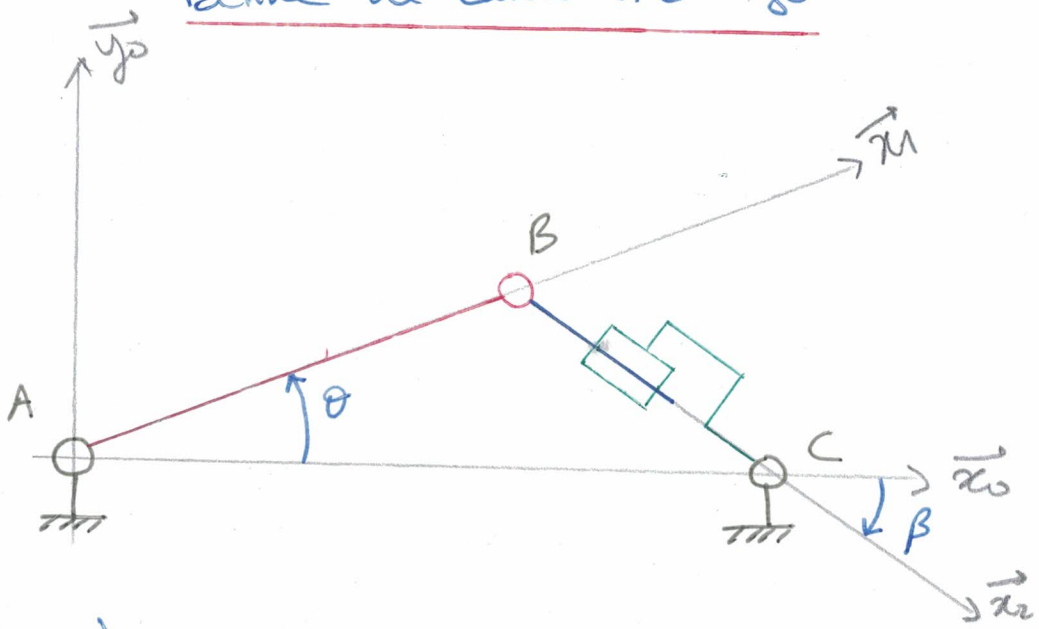
# Benne de camion : corrigé

Q1)

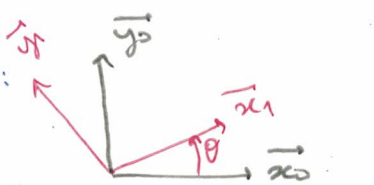



Q2) entrée : $\lambda$, sortie : $\theta$

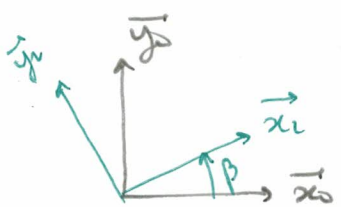
Q3) fermeture de chaine : $\overrightarrow{AB} + \overrightarrow{BC} + \overrightarrow{CA} = \vec{0}$

$$L\vec{x_1} + \lambda\vec{x_2} - x_c\vec{x_0} = \vec{0}$$

figures de projection :




$\vec{x_1} = \cos\theta\,\vec{x_0} + \sin\theta\,\vec{y_0}$




$\vec{x_2} = \cos\beta\,\vec{x_0} + \sin\beta\,\vec{y_0}$

on projette sur $\vec{x_0}$ : $L_1\cos\theta + \lambda\cos\beta - x_c = 0$

sur $\vec{y_0}$ : $L_1\sin\theta + \lambda\sin\beta = 0$

On isole $\beta$ :

$$\begin{cases} \lambda\cos\beta = x_c - L_1\cos\theta & (1) \\ \lambda\sin\beta = -L_1\sin\theta & (2) \end{cases}$$

on fait $(1)^2 + (2)^2$ : $\lambda^2 = (x_c - L_1\cos\theta)^2 + (L_1\sin\theta)^2$

$\Leftrightarrow \lambda^2 = x_c^2 + L_1^2\cos^2\theta - 2x_cL_1\cos\theta + L_1^2\sin^2\theta$ ($= L_1^2$)

$\Leftrightarrow \lambda^2 = x_c^2 + L_1^2 - 2x_cL_1\cos\theta$

d'où $\boxed{\theta = \arccos\left(\dfrac{-\lambda^2 + x_c^2 + L_1^2}{2x_cL_1}\right)}$

Q4) $\overrightarrow{V_{G\in 1/0}} = \overrightarrow{V_{A\in 1/0}} + \overrightarrow{GA} \wedge \overrightarrow{\Omega_{1/0}} = \begin{vmatrix} -x_G \\ -y_G \\ 0 \end{vmatrix}_{B_1} \wedge \begin{vmatrix} 0 \\ 0 \\ \dot\theta \end{vmatrix}_{B_1} = \begin{vmatrix} -y_G\dot\theta \\ +x_G\dot\theta \\ 0 \end{vmatrix}_{B_1}$

($\overrightarrow{V_{A\in 1/0}} = \vec{0}$ car pivot $(A,\vec{z})$)

$\boxed{\overrightarrow{V_{G\in 1/0}} = -y_G\dot\theta\,\vec{x_1} + x_G\dot\theta\,\vec{y_1}}$