

Q1) Marche \rightarrow courbe a ; Course \rightarrow courbe b (frequence + eleve)

Q2) Utiliser un filin pour bande

Q3) $\vec{OG} = \vec{OA} + \vec{AA'} + \vec{A'B} + \vec{BG} = \dots$
 $\vec{OG} = (y_A + L \cos B + y_G) \vec{y}_0 + (y_{part} + l + L \sin B + y_G) \vec{y}_1$

Q4) $\vec{AA'} + \vec{A'B} = \vec{AB} \Rightarrow l \vec{y}_1 + L \vec{y}_5 = L \vec{y}_2$

$$\begin{cases} 0 + L \cos B = L \cos \alpha \\ l + L \sin B = L \sin \alpha \end{cases} \Rightarrow \begin{cases} L \sin B = L \sin \alpha - l \\ L \cos B = L \cos \alpha \end{cases}$$

$$\Rightarrow \tan B = \frac{L \sin \alpha - l}{L \cos \alpha}$$

Q5) $L_L = \sqrt{(L \sin \alpha - l)^2 + (L \cos \alpha)^2} = \sqrt{L^2 - 2Ll \sin \alpha + l^2}$

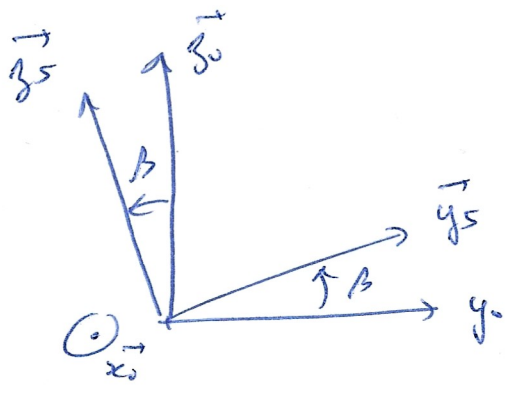
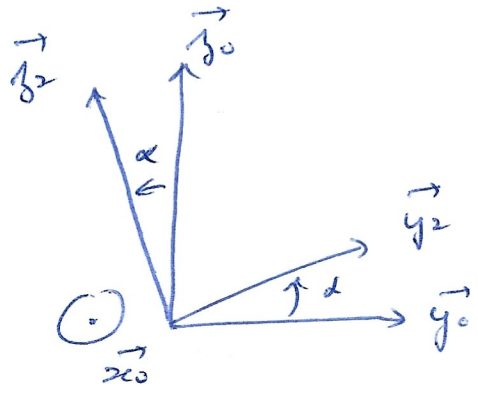
Q6) $\vec{F}_2 = F_2 \vec{y}_5$ avec $F_2 = -k_n(L - l_0)$

Q7) $\vec{F}_{23} = F_{23} \vec{y}_2$ et $\vec{F}_{2'3} = F_{2'3} \vec{y}_2$ (solides soumis a 2 forces ...)

Q8) Q9) On isole (3+5), TRS sur \vec{y}_2

$\vec{P} = -m_{35} g \vec{y}_0$; $\vec{F}_2 = -k_n(L - l_0) \vec{y}_5$; \vec{F}_{23} et $\vec{F}_{2'3}$

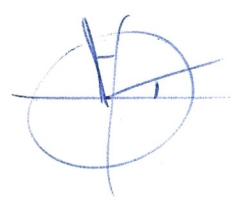
TRS $\Rightarrow -m_{35} g \vec{y}_0 \cdot \vec{y}_2 - k_n(L - l_0) \vec{y}_5 \cdot \vec{y}_2 = 0$



$-m_{35} g \cos \alpha - k_n(L - l_0) \cos(-\beta + \alpha + \frac{\pi}{2}) = 0$

$-m_{35} g \cos \alpha + \underbrace{k_n(L - l_0)}_{-F_2} \sin(\alpha - \beta) = 0$

$\Rightarrow F_2 = \frac{-m_{35} g \cos \alpha}{\sin(\alpha - \beta)}$



(2)

Q13 Dynamique

Cette question concerne le comportement dynamique du stabilisateur.

On recherche son equation de mouvement lorsqu'il est ~~sollicité~~ sollicité au niveau de la glissière par un mouvement $z_{\text{pat}}(t) = z_0 \sin(\omega t)$.

On utilise (3+5), TRD sur \vec{z}_2

$$\vec{OG} = y_A \vec{z}_0 + z_{\text{pat}} \vec{z}_0 + L \vec{y}_2 + y_G \vec{z}_0 + z_G \vec{z}_0$$

$$\vec{v}(G \in \mathcal{R}_0) = \dot{z}_{\text{pat}} \vec{z}_0 + L \dot{\alpha} \vec{z}_2$$

$$\vec{a}(G \in \mathcal{R}_0) = \ddot{z}_{\text{pat}} \vec{z}_0 + L \ddot{\alpha} \vec{z}_2 - L \dot{\alpha}^2 \vec{y}_2$$

$$\vec{a}(G \in \mathcal{R}_0) \cdot \vec{z}_2 = \ddot{\alpha} L + \ddot{z}_{\text{pat}}$$

TRD \Rightarrow

$$m_{31} \ddot{\alpha} L + L \ddot{\alpha} m_{31} = -m_{31} g \cos \alpha - F_A m(\alpha - \beta)$$

$$\Rightarrow \ddot{\alpha} = - \frac{\ddot{z}_{\text{pat}}}{L} - \frac{g \cos \alpha}{L} + \frac{F_A}{m_{31} L} m(\beta - \alpha)$$

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