

# TD Quille

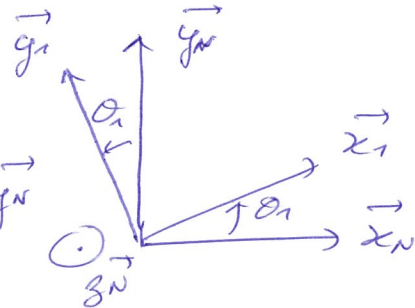
Q1 On arole (4+2), soumis à 2 forces  $\Rightarrow \dots$

Q2  $\{T_{N \rightarrow 1}\} = \begin{Bmatrix} x & L \\ y & n \\ z & 0 \end{Bmatrix}_{O, B_N}$

$\{T_{g \rightarrow 1}\} = \begin{Bmatrix} 0 & 0 \\ -m_1 g & 0 \\ 0 & 0 \end{Bmatrix}_{O, B_N}$

$\vec{\Pi}_{g \rightarrow 1}(O) = \vec{O}_{B_1} \wedge (-m_1 g \vec{y}_N)$   
 $= -L_1 \vec{y}_1 \wedge (-m_1 g \vec{y}_N) = -m_1 g L_1 m \sin \theta_1 \vec{z}_N$

$\vec{\Pi}_{F_{21}}(O) = \vec{O}_{A_2} \wedge F_{21} \vec{x}_N$   
 $= (R \vec{y}_1 - d \vec{z}_N) \wedge F_{21} \vec{x}_N$   
 $= -F_{21} R \cos \theta_1 \vec{y}_N - F_{21} d \vec{y}_N$



$\{T_{F_{21} \rightarrow 1}\} = \begin{Bmatrix} F_{21} & 0 \\ 0 & -F_{21} d \\ 0 & -F_{21} R \cos \theta_1 \end{Bmatrix}_{O, B_N}$

PFS  $\Rightarrow \begin{cases} x + F_{21} = 0 \\ y - m_1 g = 0 \\ z = 0 \end{cases} \quad \begin{cases} L = 0 \\ m - d F_{21} = 0 \\ -m_1 g L_1 m \sin \theta_1 - F_{21} R \cos \theta_1 = 0 \end{cases}$

Q3  $\{T_1\} = \begin{Bmatrix} x_1 & 0 \\ y_1 & 0 \\ 0 & 0 \end{Bmatrix}_{O_1} ; T_2 = \begin{Bmatrix} x_2 & 0 \\ y_2 & 0 \\ z_2 & 0 \end{Bmatrix}_{O_2}$

$\vec{\Pi}_1(O) = \vec{\Pi}_1(O_1) + \vec{O}_{O_1} \wedge \vec{R}_1$   
 $= \begin{pmatrix} 0 \\ 0 \\ -e \end{pmatrix} \wedge \begin{pmatrix} x_1 \\ y_1 \\ 0 \end{pmatrix} = \begin{pmatrix} e y_1 \\ -e x_1 \\ 0 \end{pmatrix}$

$\vec{\Pi}_2(O) = \vec{\Pi}_2(O_2) + \vec{O}_{O_2} \wedge \vec{R}_2$   
 $= \begin{pmatrix} 0 \\ 0 \\ e \end{pmatrix} \wedge \begin{pmatrix} x_2 \\ y_2 \\ z_2 \end{pmatrix} = \begin{pmatrix} -e y_2 \\ e x_2 \\ 0 \end{pmatrix}$

$\begin{cases} x = x_1 + x_2 = -F_{21} \\ y = y_1 + y_2 = -m_1 g \\ z = z_2 = 0 \\ L = e y_1 - e y_2 = 0 \\ m = -e x_1 + e x_2 = F_{21} d \\ N = 0 \end{cases}$

$\{T_{\text{point}}\} = \begin{Bmatrix} x & L \\ y & n \\ z & 0 \end{Bmatrix}_O \Rightarrow \begin{matrix} 5 \text{ equations} \\ 5 \text{ inconnues} \end{matrix} \Rightarrow \begin{matrix} x_1 = \dots \\ y_1 = \dots \end{matrix}$