Mécanisme de transport

Q1 $\vec{\Gamma}(A,2/1) = \ddot{x}.\vec{x_1}$

Q2 $\vec{R_c} = (\dot{x}\vec{x_1} + l\dot{\theta}\vec{x_3})m_3$, $\boxed{\vec{R_d} = (\ddot{x}\vec{x_1} + l\ddot{\theta}\vec{x_3} + l\dot{\theta}^2\vec{y_3})m_3}$

$$\vec{\sigma}(B,3/1) = \overline{\overline{I}}_B(3).\vec{\Omega}_{3/1} + m_3\vec{BG}\wedge\vec{v}(B,3/1)$$
$$= C_3\dot{\theta}\vec{z} + m_3.(-l\vec{y_3})\wedge\dot{x}\vec{x_1} = C_3\dot{\theta}\vec{z} + m_3 l\dot{x}\cos\theta\,\vec{z}$$
$$= (C_3\dot{\theta} + m_3 l\dot{x}\cos\theta)\vec{z}$$

$$\vec{\delta}(B,3/1) = \left(\frac{d\vec{\sigma}(B,3/1)}{dt}\right)_1 + m_3\underbrace{\vec{v}(B/1)}_{\dot{x}\vec{x_1}}\wedge\underbrace{\vec{v}(G,3/1)}_{\dot{x}\vec{x_1}+l\dot{\theta}\vec{x_3}}$$
$$= \left[C_3\ddot{\theta} + m_3 l(\ddot{x}\cos\theta - \dot{x}\dot{\theta}\sin\theta)\right]\vec{z} + (m_3\dot{x}l\dot{\theta}\sin\theta).\vec{z}$$
$$= \boxed{(C_3\ddot{\theta} + m_3 l\ddot{x}\cos\theta)\vec{z}}$$

Q3 $\{\mathcal{T}_{2\to3}\} = \begin{Bmatrix} X_B & - \\ Y_B & - \\ - & 0 \end{Bmatrix}_{B,B_2}$

Q5 $\vec{P} = -m_3 g.\vec{y_2}$

$\vec{M}(B) = \vec{M}(G) + \vec{BG}\wedge\vec{P}$

$= \vec{0} + (-l\vec{y_3})\wedge\vec{P}$

$\boxed{\vec{M}(B) = -m_3.g.l\sin\theta\,\vec{z}}$

(1) $\boxed{C_3\ddot{\theta} + m_3 l\ddot{x}\cos\theta = -m_3 g l\sin\theta}$

Q5 à $t=0$, $\theta=0$

$\Leftrightarrow \boxed{\ddot{\theta} = -\frac{m_3 l\ddot{x}\cos\theta}{C_3}} < 0$

Q6 $\{\mathcal{T}_{1\to2}\} = \begin{Bmatrix} 0 & - \\ Y_A & - \\ - & N_A \end{Bmatrix}_{A,B_2}$

Q7 $m_2\ddot{x} + m_3.(\ddot{x} + l\ddot{\theta}\vec{x_3}.\vec{x_1} + l\dot{\theta}^2\vec{y_3}.\vec{x_1}) = F$

(2) $\boxed{m_2\ddot{x} + m_3(\ddot{x} + l\ddot{\theta}\cos\theta + l\dot{\theta}^2\sin\theta) = F}$

Q8 à $t=0$, $\theta=0$, $\Rightarrow \dot{\theta}=0 \Rightarrow$ ~~$\ddot{\theta}$~~

(2) $\Rightarrow$ $F = m_2\ddot{x} + m_3\ddot{x} + m_3 l\cos\theta\left(\frac{-m_3 l\ddot{x}\cos\theta}{C_3}\right)$

$$\boxed{F = \ddot{x}\left(m_2 + m_3 - \frac{(m_3 l)^2}{C_3}\right)}$$

Q9 $\dot{\theta}=0 \Rightarrow$ et $\ddot{\theta}=0 \Rightarrow$ $\tan\theta = -\frac{\ddot{x}}{g}$

équation (1) $\Rightarrow$