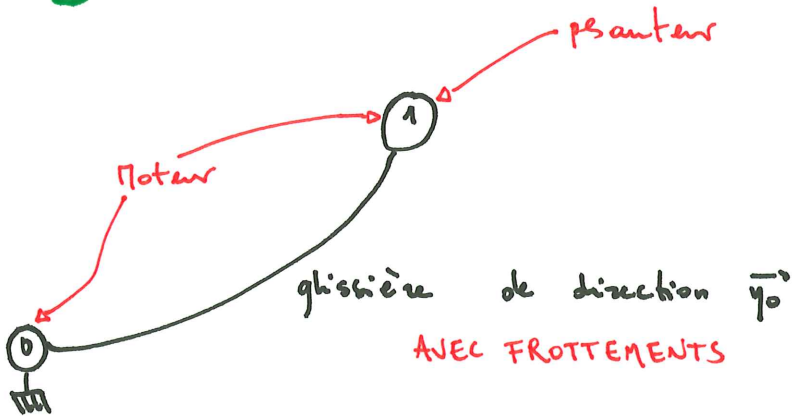


MACHINE DE TRACTION

(a)



$$\left\{ \begin{array}{l} 0 \xrightarrow{g} 1 \\ 0 \xrightarrow{\text{glissière}} 1 \end{array} \right\} = \left\{ \begin{array}{l} \vec{R}_{0,1} = X_{01} \cdot \vec{z}_0 \pm F_r \cdot \vec{y}_0 - k \cdot \dot{y} \cdot \vec{y}_0 + Z_{01} \cdot \vec{z}_0 \\ \vec{\Pi}_{0,0} \xrightarrow{g} 1 = L_{01} \cdot \vec{n}_0 + \Pi_{01} \cdot \vec{y}_0 + N_{01} \cdot \vec{z}_0 \end{array} \right. = -k \cdot \vec{V}_{G \in 1/0}$$

k : coefficient de frottement visqueux (N/(m/s))
 F_r : " " " " sec (N)

(2) J'isole 1 soumis aux actions mécaniques extérieures suivantes:

- $0 \xrightarrow{g} 1$
- $0 \xrightarrow{\text{mot}} 1$
- pesanteur $\rightarrow 1$

J'écris le th. des résultantes en projection sur \vec{y}_0 :

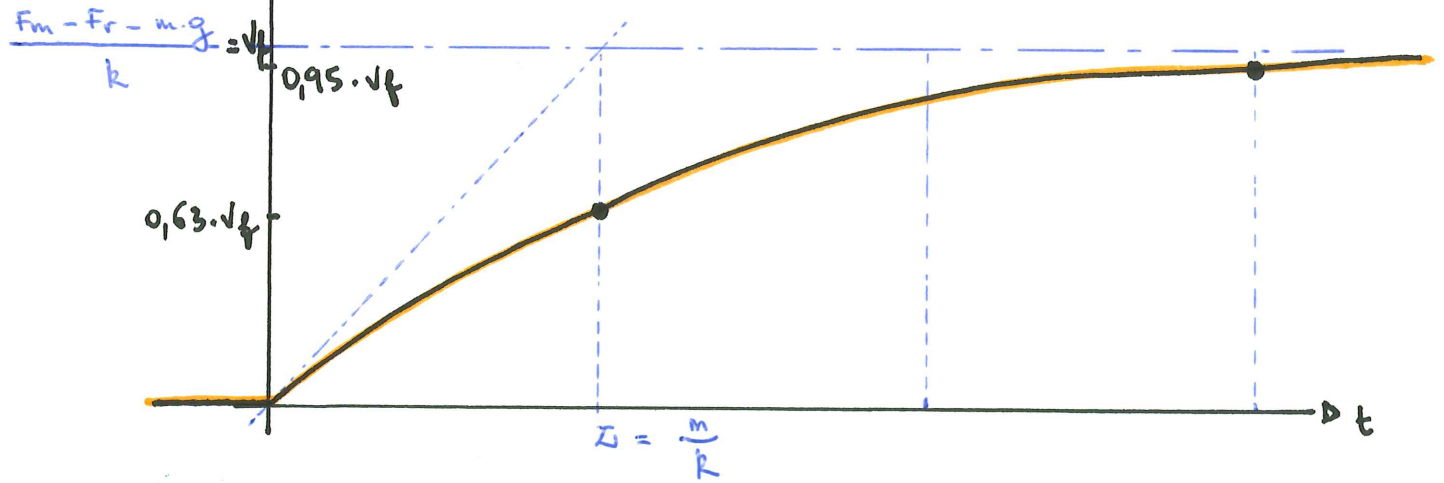
$$\underbrace{\vec{R}_{0,1} \cdot \vec{y}_0}_{\pm F_r - k \cdot \dot{y}} + \underbrace{\vec{R}_{0,1} \xrightarrow{\text{mot}} 1 \cdot \vec{y}_0}_{F_m} + \underbrace{\vec{R}_{ps \rightarrow 1} \cdot \vec{y}_0}_{-m \cdot g} = \vec{R}_{d_{1/0}} \cdot \vec{y}_0$$

$$\begin{aligned} \vec{R}_{d_{1/0}} \cdot \vec{y}_0 &= m \cdot \frac{d}{dt} (\vec{V}_{G \in 1/0}) \cdot \vec{y}_0 \\ &= m \cdot \frac{d}{dt} (\vec{V}_{G \in 1/0} \cdot \vec{y}_0) \\ &= m \cdot \ddot{y} \end{aligned}$$

On a donc : $F_m \pm F_r - m \cdot g = m \cdot \ddot{y} + k \cdot \dot{y}$

③

$\dot{y} = \text{vitene}$



$$\frac{F_m - F_r - m \cdot g}{m} = \ddot{y} + \frac{k}{m} \cdot \dot{y}$$

Annotations for the equation above:

- An arrow points from \ddot{y} to m/s^2 .
- An arrow points from \dot{y} to m/s .
- The term $\frac{k}{m}$ is circled, with an arrow pointing to $\tau = \frac{1}{\tau}$.