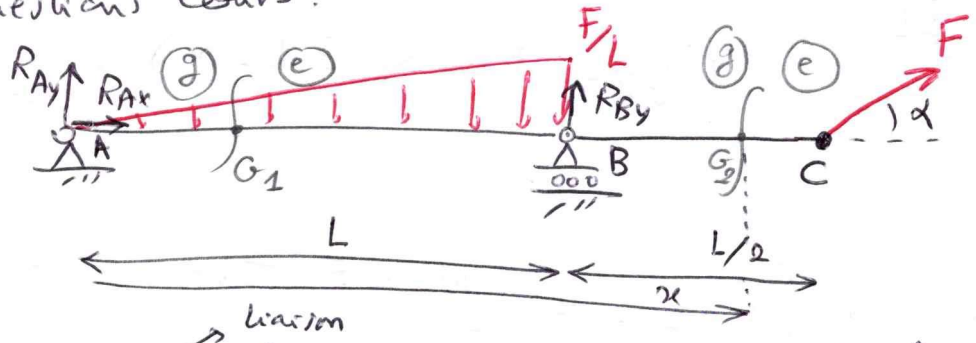
# Correction DS1 (Me 21 a.)
## 2018 - 2019

**Ex 1 :** Questions Cours.

**Ex 2 :**




1) Pts particuliers : A → liaison → ext → début de charge rép
B → liaison → fi de charge rép
C → ext → Fau appliquée

2) articulation en A
$R_{Ax}$
$R_{Ay}$
Appui simple en B
$R_{By}$

3) Deux zones de coupure : $G_1$ entre A et B
$G_2$ entre B et C.

4) PFS : $\sum \vec{F}_{ext} = \vec{0}$ →
$x : R_{Ax} + F\cos\alpha = 0 \Rightarrow \boxed{R_{Ax} = -F\cos\alpha}$
$y : R_{Ay} + R_{By} - \frac{F}{L}\cdot\frac{L}{2} + F\sin\alpha = 0$
$\Rightarrow R_{Ay} + R_{By} = \frac{F}{2} - F\sin\alpha$ (*)

$\sum \vec{M}_A = \vec{0}$ → $z : -\underbrace{\frac{F}{L}\cdot\frac{L}{2}}_{F/2}\cdot\frac{2}{3}L + R_{By}\cdot L + F\sin\alpha\cdot\frac{3}{2}L = 0$

$\Rightarrow \boxed{R_{By} = \frac{F}{3} - \frac{3}{2}F\sin\alpha}$

(*) $\Rightarrow R_{Ay} = \frac{F}{2} - F\sin\alpha - \frac{F}{3} + \frac{3}{2}F\sin\alpha$

$\boxed{R_{Ay} = \frac{F}{6} + \frac{F}{2}\sin\alpha}$

5) Le PFS est obligé car la première coupure est entre deux liaisons.

6) $\{\tau_{coh}\}_{G_2} = + \{\tau_{eff\ extrêmes}/\bar{e}\}_{G_2}$

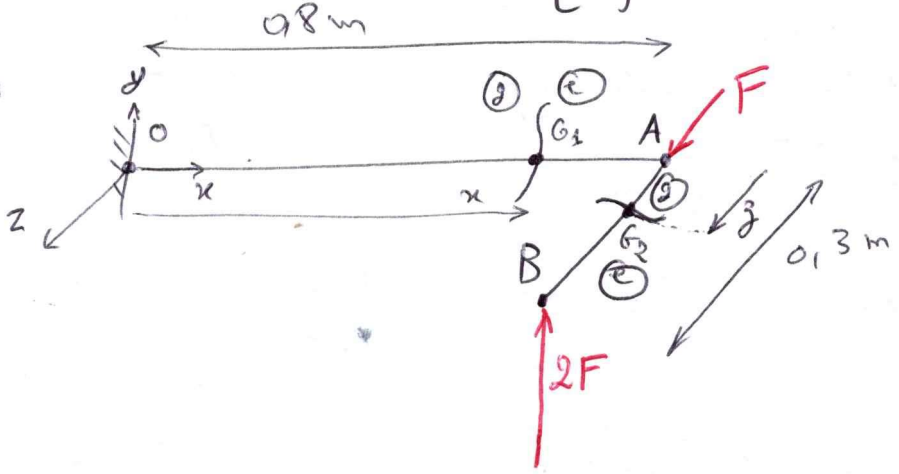
$G_2(x, 0, 0)$ $\quad L \leq x \leq \frac{3}{2}L$

$$= \begin{cases} N_x = F.\cos\alpha & \text{Traction} \\ T_y = F.\sin\alpha & \text{cisaillement} \\ \Pi_{fz} = F.\sin\alpha.\left(\frac{3}{2}L - x\right) & \text{flexion simple} \end{cases}$$

7) ———

8) $\alpha = 0 \Rightarrow \{\tau_{coh}\}_{G_2} = \begin{cases} N_x = F \\ T_y = 0 \\ \Pi_{fz} = 0 \end{cases}$ Traction pure

Ex 3 :




$\{\tau_{coh}\}_{G_1} = + \{\tau_{eff\ ext}/\bar{e}\}_{G_1} = \begin{cases} N_x = 0 \\ T_y = 2F & \text{cis} \\ T_z = F & \text{cis} \\ \Pi_{tx} = -2F.\ 0,3 & \text{Torsion} \\ \Pi_{fy} = -F.\ (0,8 - x) & \text{flexion simple autour de y} \\ \Pi_{fz} = +2F.\ (0,8 - x) & \text{flexion simple autour de z} \end{cases}$

$G_1(x, 0, 0)$

$0 \leq x \leq 0,8\ m$

$\{\tau_{coh}\}_{G_2} = + \{\tau_{eff\ ext}/\bar{e}\}_{G_2} = \begin{cases} T_x = 0 \\ T_y = 2F & \text{cis} \\ N_z = 0 \\ \Pi_{fx} = -2F.\ (0,3 - z) & \text{flexion simple autour de x} \\ \Pi_{fy} = 0 \\ \Pi_{tz} = 0 \end{cases}$

$G_2(0,8;\ 0;\ z)$

$0 \leq z \leq 0,3\ m$