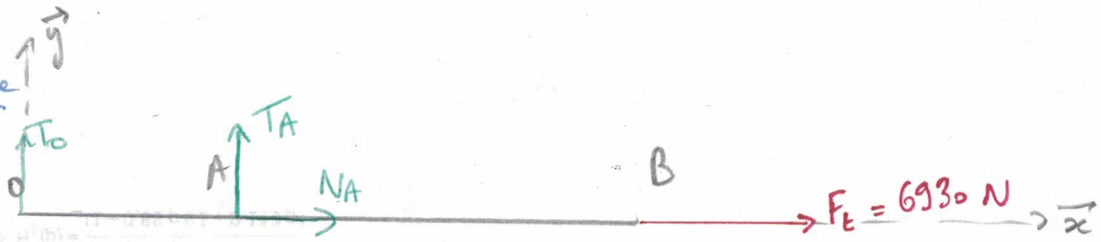
DM RdM

1) Traction pure

Q1)



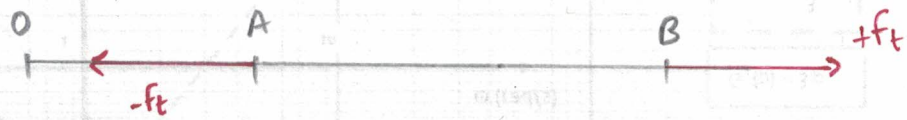
TRS sur $\vec{x}$: $N_A + F_t = 0$ $\Leftrightarrow$ $N_A = -F_t = -6930\ N$

TRS sur $\vec{y}$: $T_0 + T_A = 0$

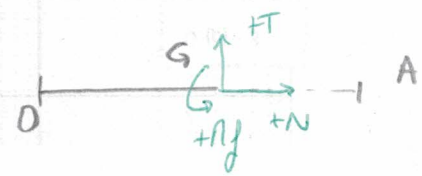
TMS en A sur $\vec{z}$: $T_0 \cdot OA = 0$ $\Rightarrow$ $T_0 = 0$

puis $T_A = -T_0 = 0$

Q2)

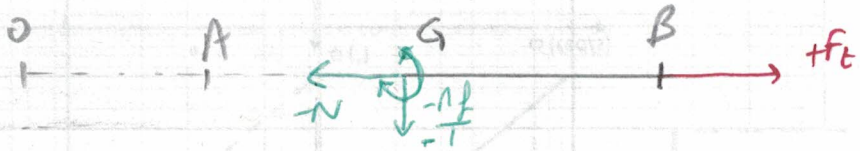


secteur OA : on isole à gauche



$\Rightarrow$ $N = T = 0$, $Nf = 0$

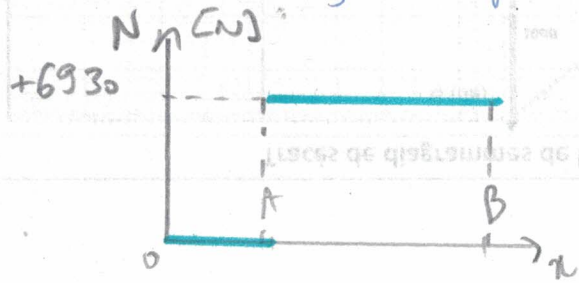
secteur AB : on isole à droite

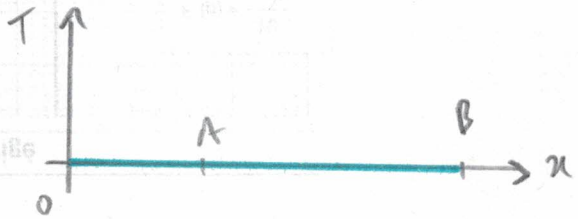


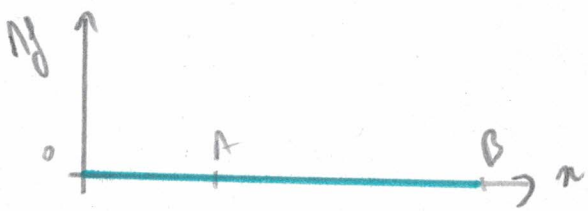
TRS sur $\vec{x}$: $-N + f_t = 0$ $\Rightarrow$ $N = f_t$

TRS sur $\vec{y}$: $-T = 0$ $\Rightarrow$ $T = 0$

TMS en G sur $\vec{z}$: $-Nf = 0$ $\Rightarrow$ $Nf = 0$







2°) Flexion simple

Q1°)

TRS sur $\vec{x}$: $N_A = 0$

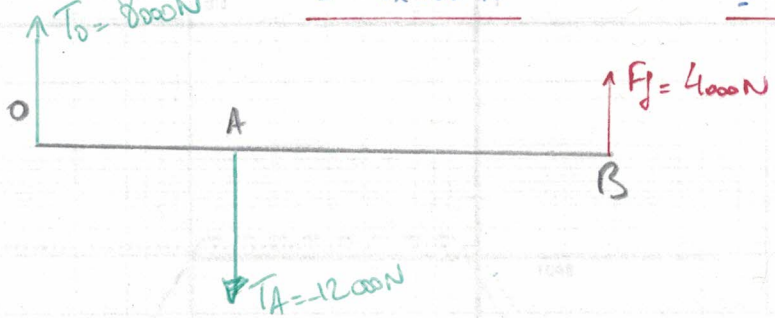
TRS sur $\vec{y}$: $T_0 + T_A + f_f = 0$

TRS en O sur $\vec{z}$: $T_A \cdot OA + F_f \cdot OB = 0$

d'où $T_A = - F_f \cdot \frac{OB}{OA}$ et $T_0 = - f_f - T_A$

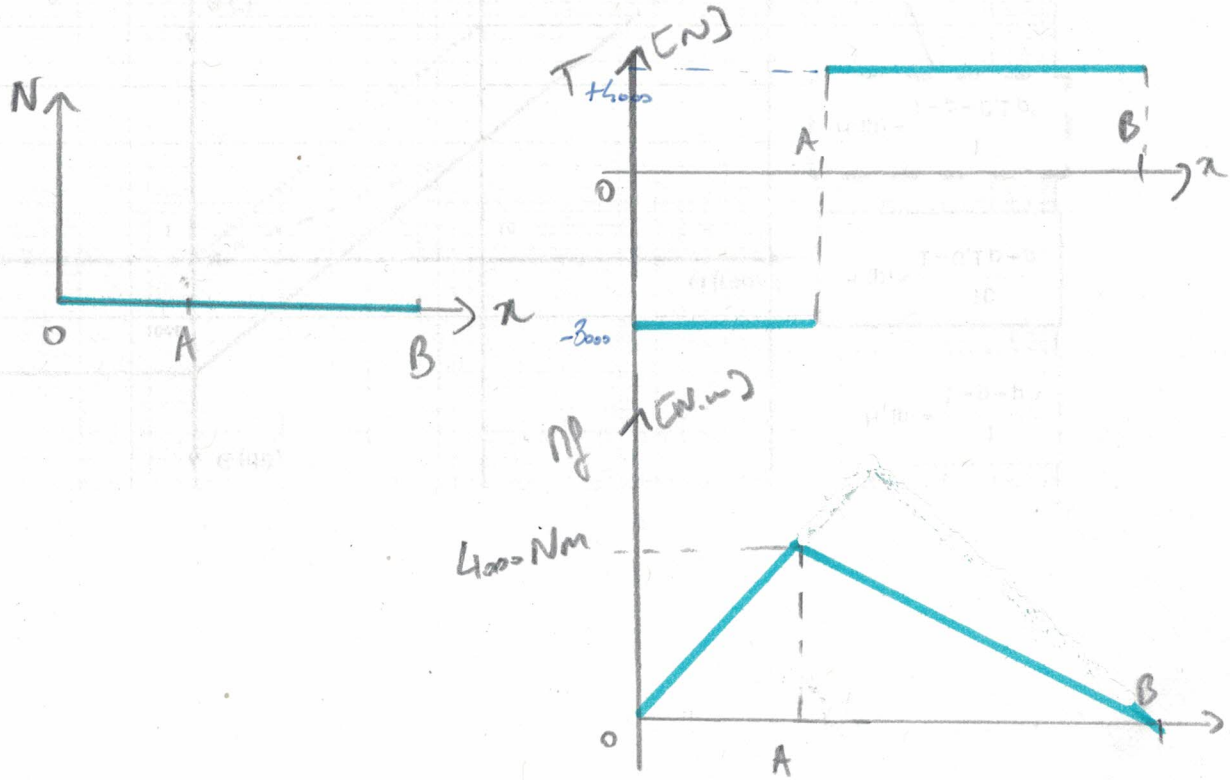
$= -12000\ N$ $= +8000\ N$

Q2)



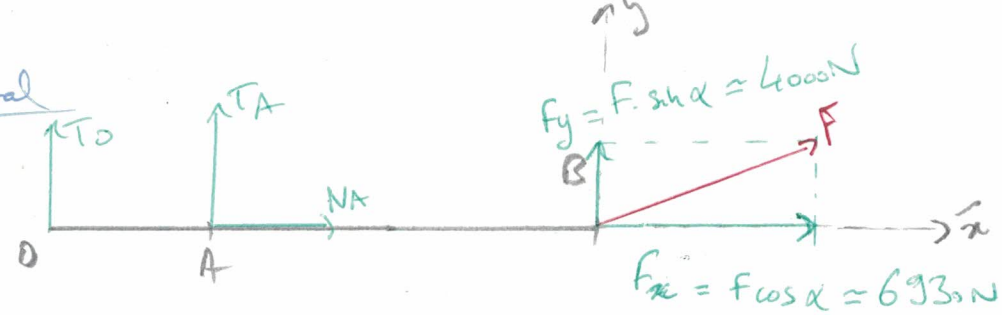
secteur OA : on isole à gauche $\Rightarrow \begin{cases} N = 0 \\ T = -8000N \\ M_f = +8000\,x \end{cases}$

secteur AB : on isole à droite $\Rightarrow \begin{cases} N = 0 \\ T = +4000\,N \\ M_f = 4000.(1{,}5 - x) \end{cases}$



3) Cas général

Q1)



TRS sur $\vec{x}$: $N_A + f_x = 0$ $\Rightarrow$ $N_A = -f_x = -6930\,N$

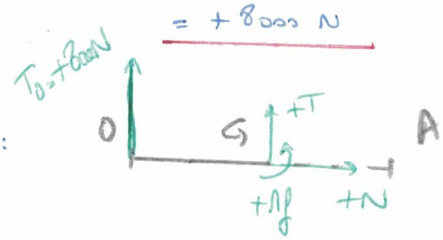
TRS sur $\vec{y}$: $T_O + T_A + f_y = 0$

TMS en O sur $\vec{z}$: $T_A \cdot OA + f_y \cdot OB = 0$

d'où $T_A = -f_y \cdot \frac{OB}{OA}$ et $T_O = -f_y - T_A =$

$= -12000\,N$ $= +8000\,N$

Q2) secteur OA : on isole à gauche :

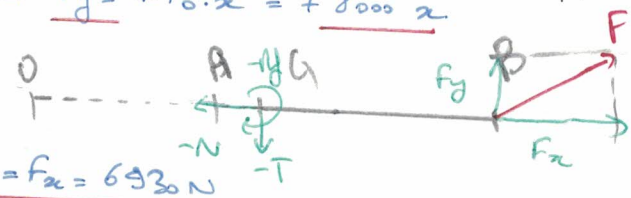


TRS sur $\vec{x}$: $N = 0$

TRS sur $\vec{y}$: $T_O + T = 0 \Rightarrow T = -8000\,N$

TMS en G sur $\vec{z}$: $M_f - T_O \cdot x = 0 \Rightarrow M_f = +T_O \cdot x = +8000\,x$

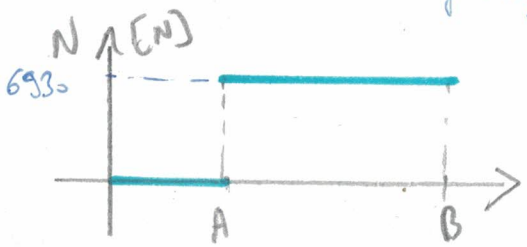
secteur AB : on isole à droite :

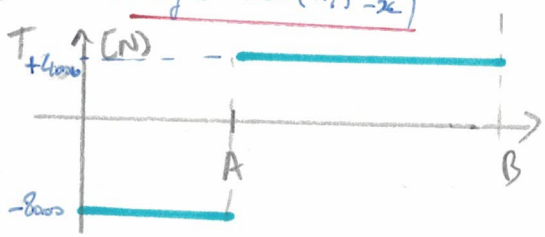


TRS sur $\vec{x}$: $-N + f_x = 0 \Rightarrow N = f_x = 6930\,N$

TRS sur $\vec{y}$: $-T + f_y = 0 \Rightarrow T = f_y = +4000\,N$

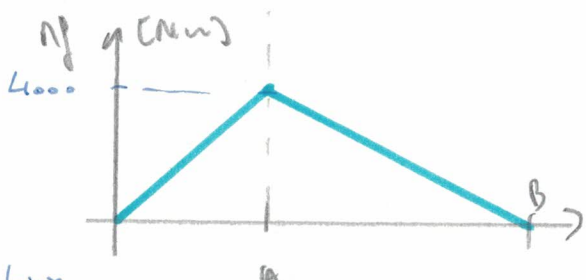
TMS en G sur $\vec{z}$: $-M_f + f_y \cdot (1,5 - x) = 0 \Rightarrow M_f = 4000\,(1,5 - x)$





Q3) $F_x = F_f \cdot \cos(30°) = 6930\,N$ $\Rightarrow$ partie 1

$F_y = F_f \sin(30°) = 4000\,N$ $\Rightarrow$ partie 2



Q4) Par linéarité, le diagramme d'efforts intérieurs de la partie 3° est la somme de ceux des parties 1 et 2 !