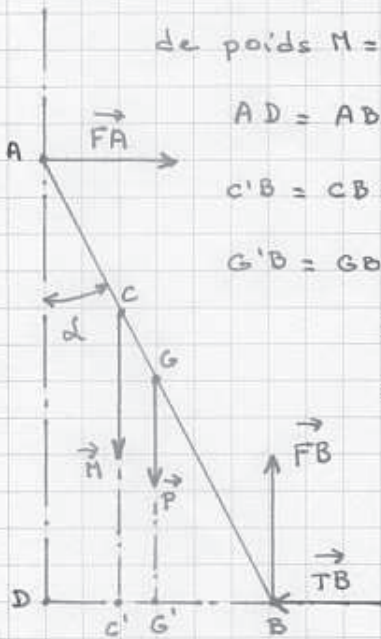


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1°) Pas de Frottement en "A" et "B"

Echelle de poids $P = 60\text{N}$ $Lg AB = 3\text{m}$ $\angle \alpha = 30^\circ$. Une personne de poids $M = 700\text{N}$ se trouve en C ($CB = 2\text{m}$)



$$AD = AB \cos \alpha = 2,598\text{m}$$

$$c'B = CB \sin \alpha = 1\text{m}$$

$$DB = AB \sin \alpha = 1,5\text{m}$$

$$G'B = GB \sin \alpha = 0,75\text{m}$$

$$\vec{F}_A \times AD = (\vec{M} \times c'B) + (\vec{P} \times G'B)$$

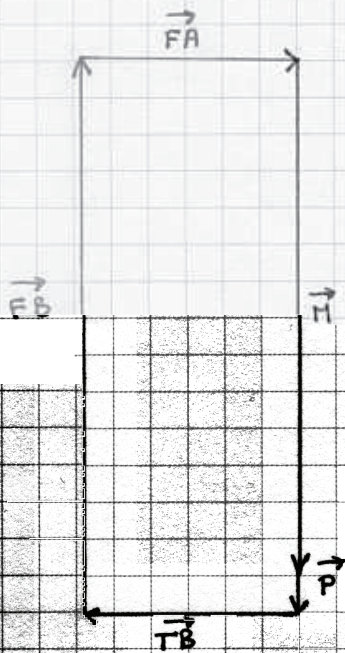
$$\vec{F}_A = \vec{T}_B = 286,8\text{N} \quad (\vec{T}_B = \vec{F} \text{ de compensation})$$

Pour \vec{F}_B , centre des \mathcal{L} en A

$$\vec{F}_B \times DB = (\vec{M} \times c'D) + (\vec{P} \times G'D) + (\vec{T}_B \times DA)$$

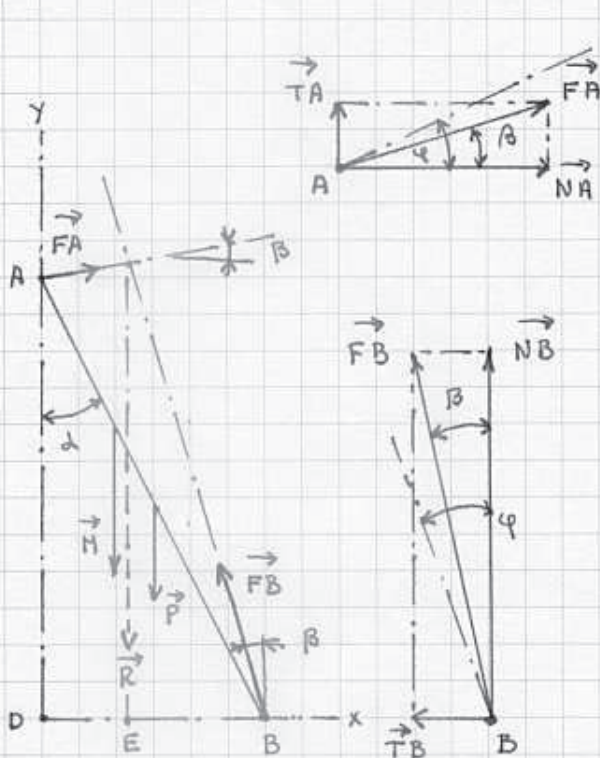
$$\vec{F}_B = 760\text{N} \Rightarrow \Sigma \mathcal{M} \text{ et } \vec{P}$$

Polygone fermé \Rightarrow équilibre



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2°) Frottement en "A" et "B" ($f = 0,3 \Rightarrow \varphi = 16,7^\circ$)



$$R = M + P = 760 \text{ N}$$

$$EB = \frac{(M \times C'B) + (P \times G'B)}{R} = 0,98 \text{ m}$$

$$FB = \frac{R}{\sqrt{1+f^2}} = 728 \text{ N}$$

$$FA = R \cdot f \sqrt{\frac{1}{1+f^2}} = 218,4 \text{ N}$$

$$TA = FA \times \sin \varphi = 62,8 \text{ N}$$

$$NA = FA \times \cos \varphi = 209,2 \text{ N}$$

$$TB = FB \times \sin \varphi = 209,2 \text{ N}$$

$$NB = FB \times \cos \varphi = 697,3 \text{ N}$$

$$(\sum F_y) \quad \vec{R} - (TA + NB) = 0$$

$$(\sum F_x) \quad NA - TB = 0$$

