

Solution M.R.

Ex01:

$$\sum \vec{F}_i = \vec{0}, \vec{P} + \vec{T}_A + \vec{T}_B = \vec{0} \quad (0,15)$$

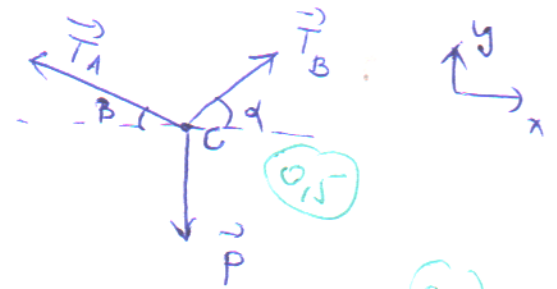
Par projection: $ox: T_B \cos \alpha + T_A \cos \beta = 0 \quad (1)$

$$oy: -P + T_B \sin \alpha + T_A \sin \beta = 0 \quad (2)$$

de (1): $T_B = T_A \frac{\cos \beta}{\cos \alpha} \quad (3)$

(3) dans (2): $T_A = \frac{P}{\cos \beta \tan \alpha + \sin \beta} \quad (0,17)$

AN: $T_A = 528,8 \text{ N} \quad (1)$
 $T_B = 695,4 \text{ N} \quad (1)$



$$\tan \alpha = \frac{1,22}{0,9} \Rightarrow \alpha = 53,6^\circ$$

$$\tan \beta = \frac{1,22}{1,52} \Rightarrow \beta = 38,7^\circ$$

Ex02:

$$\sum \vec{F}_i = \vec{0} \Rightarrow \vec{P} + \vec{T} + \vec{N} + \vec{R} = \vec{0}$$

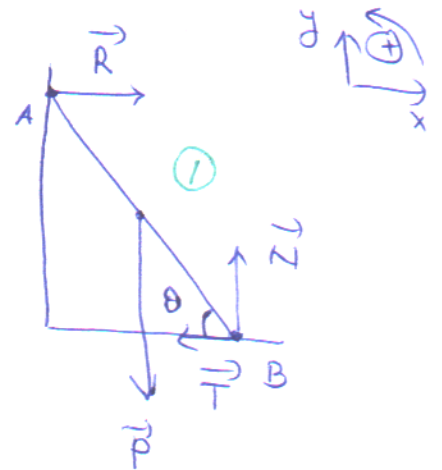
Par projection: $ox: R - T = 0 \Rightarrow R = T$

$$oy: -P = N = 0 \Rightarrow N = P = 178 \text{ N} \quad (1)$$

$$\sum M_B(\vec{F}_i) = 0 \Rightarrow M_B(N) + M_B(T) + M_B(P) + M_B(R) = 0$$

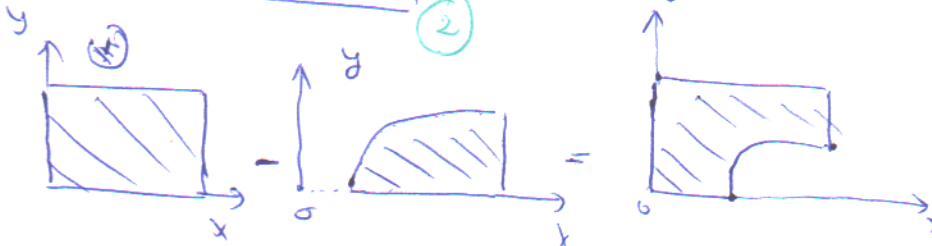
$$P \frac{L}{2} \cos \theta - R L \sin \theta = 0 \Rightarrow R = \frac{P}{2 \tan \theta}$$

donc $R = T = 79,8 \text{ N} \quad (2)$



$$\cos \theta = \frac{1,22}{1,83} \Rightarrow \theta = 48,1^\circ$$

Ex03:



	carre	1/4 disque
x_i	76 (0,15)	108,69 (0,15)
y_i	76 (0,15)	43,31 (0,15)
S_i	23104 (0,15)	8167,14 (0,15)

$$x_G = \frac{x_1 S_1 - x_2 S_2}{S_1 - S_2} \quad (0,15)$$

$$y_G = \frac{y_1 S_1 - y_2 S_2}{S_1 - S_2} \quad (0,15)$$

$$x_G = 58,12 \text{ mm} \quad (0,15)$$

$$y_G = 93,87 \text{ mm} \quad (0,15)$$