

Solution Phys 04

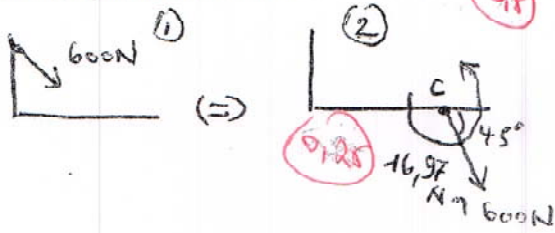
Exo 1: (05 points)

1) force-couple au point C:

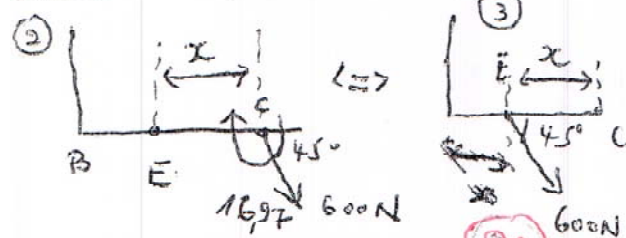
$$\sum \vec{F} = 600 \text{ N}$$

$$\sum M_C(\vec{F}_i) = -600 \cos 45 \cdot 120 + 600 \sin 45 \cdot 160$$

$$\sum M_C(\vec{F}_i) = 16970,56 = 16,97 \text{ N.m}$$



2) force unique:



$$\sum \vec{F} = 600 \text{ N}$$

$$\sum M_E(\vec{F}_i) = 0$$

$$= -16,97 - 600 \cdot x \sin 45 = 0$$

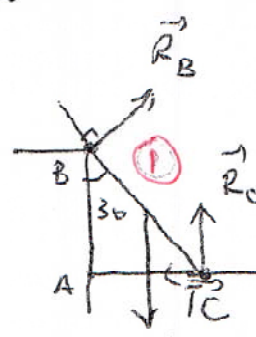
$$\Rightarrow x = \frac{16,97}{600 \sin 45}$$

$$x = 40 \text{ mm}$$

Exo 2: (08 points)

$$\sum \vec{F}_C = \vec{0}$$

$$\vec{P} + \vec{R}_B + \vec{R}_C + \vec{T}_C = \vec{0}$$



$$\text{Ox: } -T_C + R_B \cos 30 = 0 \quad (1)$$

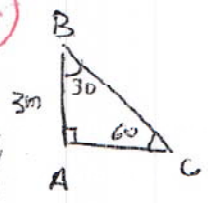
$$\text{Oy: } -P + R_C + R_B \sin 30 = 0 \quad (2)$$

$$\sum M_C(\vec{F}_i) = 0$$

$$M_C(\vec{P}) + M_C(\vec{T}_C) + M_C(\vec{R}_B) = 0$$

$$P \frac{L}{2} \cos 60 - R_B \cdot BC = 0$$

$$BC = \frac{AB}{\cos 30} = 3,46 \text{ m}$$



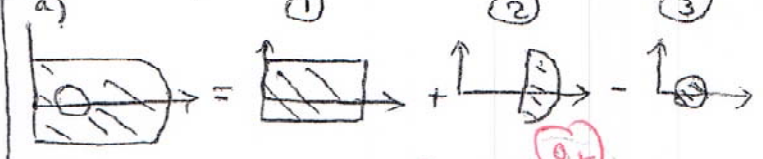
$$\text{donc } R_B = \frac{PL \cos 60}{2 BC}$$

$$\text{A.N. } R_B = 17,34 \text{ N}$$

$$\text{de (1): } T_C = R_B \cos 30, \text{ AN: } T_C = 15 \text{ N}$$

$$\text{de (2): } R_C = P + R_B \sin 30, \text{ AN: } R_C = 68,67 \text{ N}$$

Exo 3: (07 points)



Par symétrie $y_G = 0$

3pt	(1)	(2)	(3)
x (cm)	4	9,27	3
S_i (cm ²)	48	14,13	3,14

$$G(5,31,0)$$

$$x_G = \frac{x_1 S_1 + x_2 S_2 - x_3 S_3}{S_1 + S_2 - S_3}, \text{ AN: } x_G = 5,31 \text{ cm}$$

2) Le volume:

$$V = 2\pi A x_G$$

$$V = 1969,1 \text{ cm}^3$$