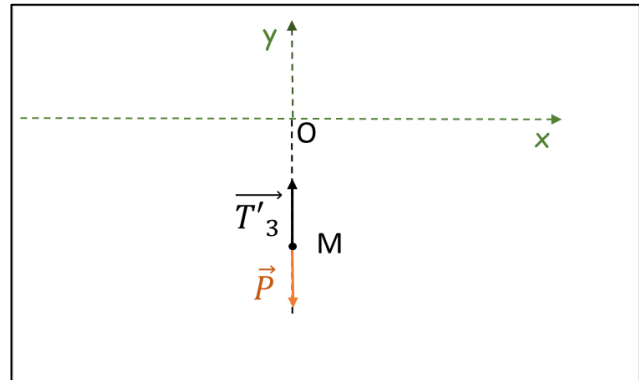
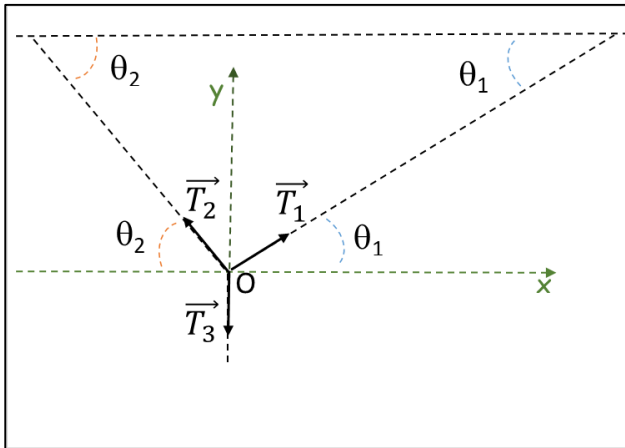
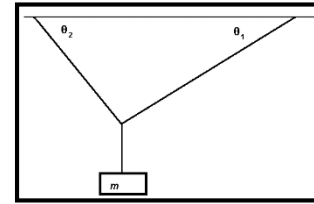


## DINAMICA

### Esercizio 20

Un sacco di cemento di massa  $m = 32.5 \text{ kg}$ , è sostenuto da tre funi come è mostrato in figura. Due funi formano gli angoli  $\theta_1 = 10.0^\circ$  e  $\theta_2 = 25.0^\circ$  con l'orizzontale. Se il sistema è in equilibrio, determinare le tensioni  $T_1$ ,  $T_2$  e  $T_3$  nelle funi.



Condizione di equilibrio:

$$\vec{F}_{tot} = 0$$

$$\vec{T}_1 + \vec{T}_2 + \vec{T}_3 = 0 \quad ; \quad \vec{P} + \vec{T}'_3 = 0$$

$$\begin{cases} T_{1x} + T_{2x} + T_{3x} = 0 \\ T_{1y} + T_{2y} + T_{3y} = 0 \end{cases} \quad ; \quad \begin{cases} P_y + T'_{3y} = 0 \end{cases}$$

$$\begin{cases} T_1 \cos \theta_1 - T_2 \cos \theta_2 + 0 = 0 \\ T_1 \sin \theta_1 + T_2 \sin \theta_2 - T_3 = 0 \end{cases} \quad ; \quad \begin{cases} -P_y + T'_3 = 0 \end{cases}$$

$$\begin{cases} T_3 = T'_3 = P_y = P \\ T_2 = T_1 \frac{\cos \theta_1}{\cos \theta_2} \\ T_1 \sin \theta_1 + T_1 \frac{\cos \theta_1}{\cos \theta_2} \sin \theta_2 = T_3 \end{cases}$$

$$\begin{cases} T_3 = T'_3 = P_y = P = 32.5 \times 9.80 = 318 \text{ N} \\ T_1 = \frac{T_3}{\sin \theta_1 + \cos \theta_1 \tan \theta_2} = \frac{32.5 \times 9.80}{\sin(10) + \cos(10) \tan(25)} = 503 \text{ N} \\ T_2 = T_1 \frac{\cos \theta_1}{\cos \theta_2} = 503 \frac{\cos(10)}{\cos(25)} = 547 \text{ N} \end{cases}$$