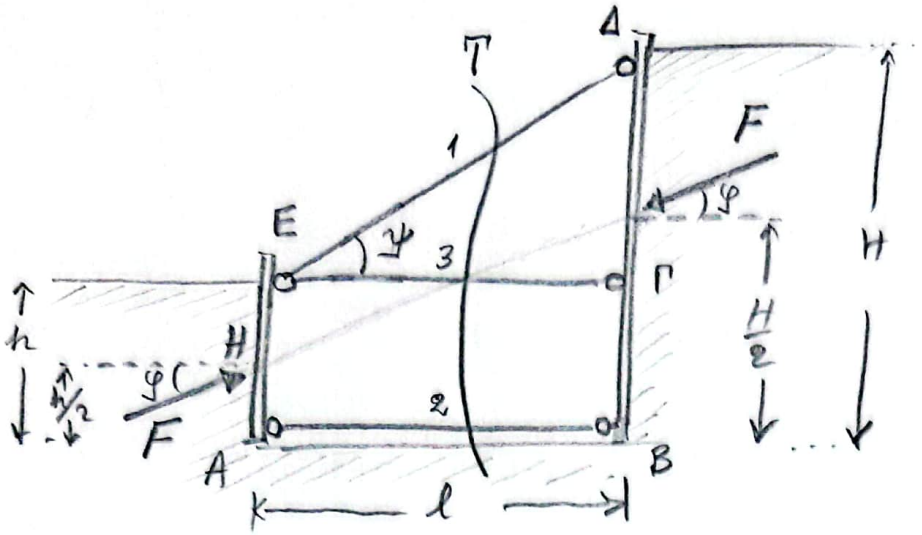
ΑΣΚΗΣΗ 3-10



Δίνονται

$h = \alpha$

$H = 3\alpha$

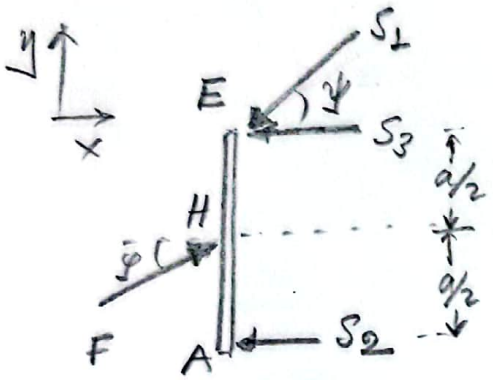
$l = 3\alpha$

F, φ

Ζητούνται

S_1, S_2, S_3

Λύση



Ισορροπία (αφού $\vec{F}, -\vec{F}$ στον ίδιο φορέα)

$$\circlearrowleft \sum M_E = 0 \Rightarrow F\cos\varphi \cdot \frac{a}{2} - S_2 a = 0 \Rightarrow$$

$$\Rightarrow \boxed{S_2 = \frac{F\cos\varphi}{2} = 0.5F\cos\varphi}$$

$$\uparrow \sum F_y = 0 \Rightarrow F\sin\varphi - S_1\sin\psi = 0 \Rightarrow$$

$$\Rightarrow S_1 = F\frac{\sin\varphi}{\sin\psi}$$

ΔΕΣ

(μετά από τομή Ritter)

$$\psi = \tan^{-1}\frac{\frac{3\alpha}{2}}{3\alpha} = 26.56^\circ \begin{cases} \cos\psi = 0.894 \\ \sin\psi = 0.447 \end{cases}$$

$$\boxed{S_1 = 2.24F\sin\varphi}$$

$$\rightarrow \sum F_x = 0 \Rightarrow F\cos\varphi - S_1\cos\psi - S_2 = S_3 \Rightarrow$$

$$\Rightarrow \boxed{S_3 = F\cos\varphi - 2.0F\sin\varphi - 0.5F\cos\varphi = 0.5F\cos\varphi - 2F\sin\varphi}$$

Σαρώθηκε με το CamScanner