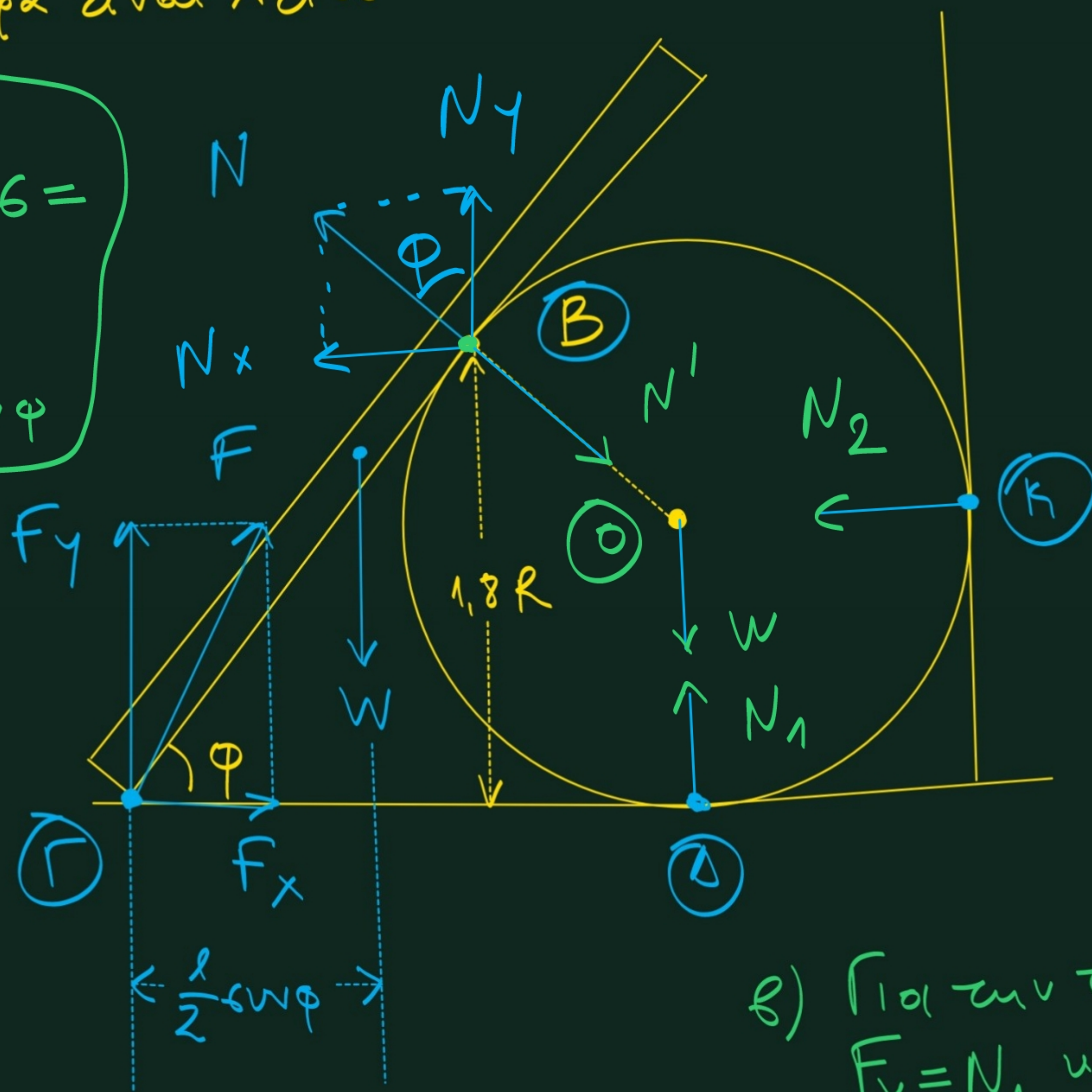


Αρ. 4.154

Η σφαίρα είναι λεία

γ) $N'_x = N_x =$
 $N \cdot \omega\varphi = 25 \cdot 0,6 =$
 $= 15 \text{ N}$
 $N'_y = N_y = N \cdot \sigma\upsilon\varphi$
 $= 25 \cdot 0,8 =$
 $= 20 \text{ N}$



α) $\sum \tau(r) = 0 \Rightarrow N \cdot B\Gamma - W \cdot \frac{L}{2} \sigma\upsilon\varphi = 0$

$\omega\varphi = \frac{1,8R}{B\Gamma} \Rightarrow B\Gamma = \frac{1,8R}{\omega\varphi} = \frac{1,8R}{0,6} = 3R$

Αρα: $N \cdot 3R = W \cdot \frac{L}{2} \cdot \sigma\upsilon\varphi \Rightarrow$

$N \cdot 3 \cdot 0,96 = 45 \cdot \frac{4}{2} \cdot 0,8 \Rightarrow$

$N = \frac{45 \cdot 2 \cdot 0,8}{3 \cdot 4 \cdot 0,24} = \frac{15 \cdot 0,8}{2 \cdot 0,24} =$

$= \frac{15 \cdot 80}{2 \cdot 24} = \frac{15 \cdot 80}{2 \cdot 3 \cdot 8} = 25 \text{ N}$

β) Για την τριβή έχουμε:
 $F_y = N_1$ και $F_x = T_1$

$T_1 = \gamma N_1 \Rightarrow F_y = \gamma F_x \Rightarrow$

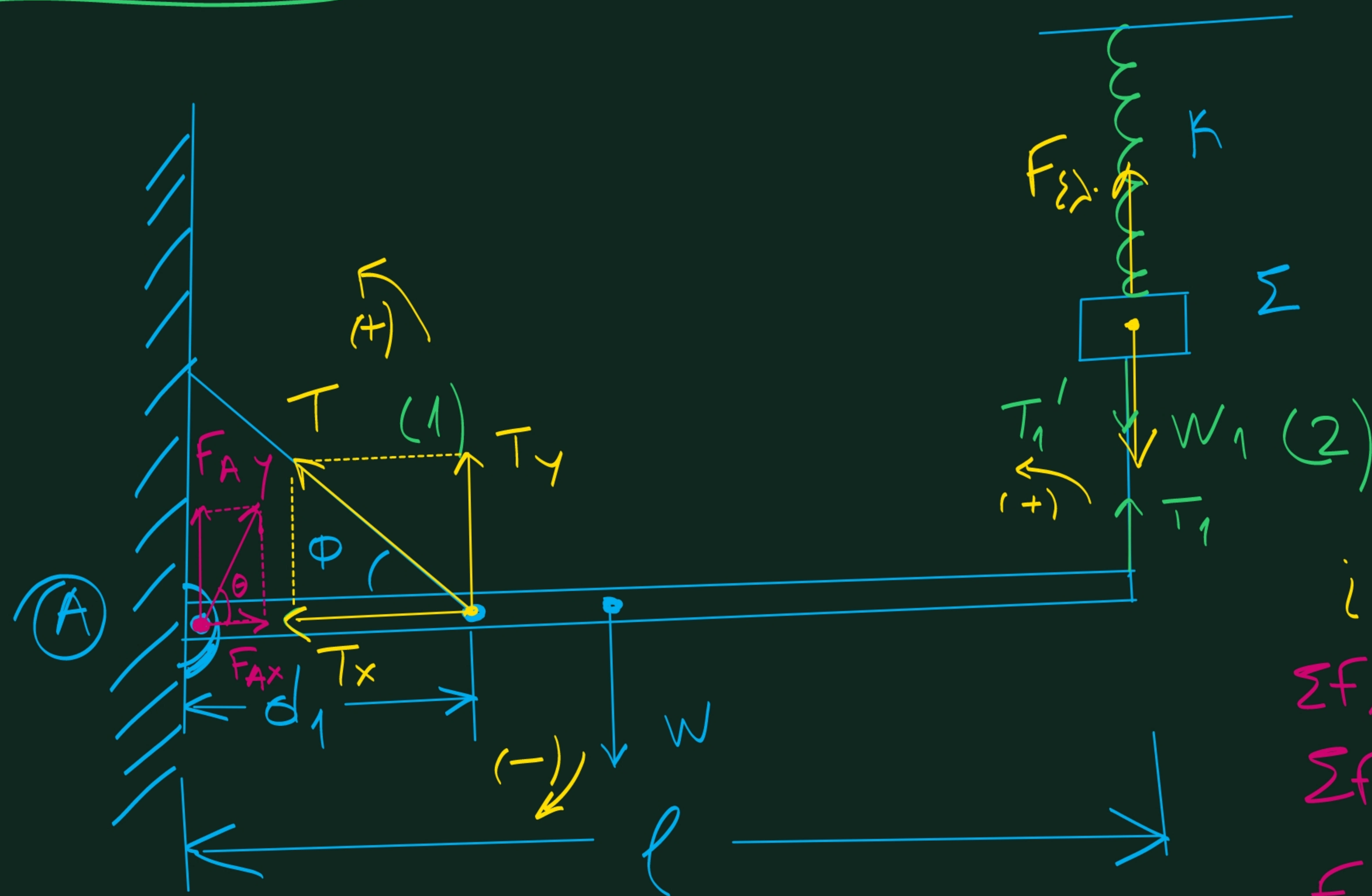
Αρα: $\gamma = \frac{F_x}{F_y} = \frac{15}{25} \Rightarrow$

$\gamma = 0,6$

$\sum F_y = 0 \Rightarrow F_y + N_y = W \Rightarrow F_y = W - N \cdot \sigma\upsilon\varphi \Rightarrow F_y = 45 - 25 \cdot 0,8 = 25 \text{ N}$

$\sum F_x = 0 \Rightarrow F_x = N_x \Rightarrow F_x = N \cdot \omega\varphi = 25 \cdot 0,6 \Rightarrow F_x = 15 \text{ N}$

Ασκ. 4.156



$$\begin{aligned} W &= 90 \text{ N} \\ l &= 2 \text{ m} \\ T_{\text{op}} &= 250 \text{ N} \\ d_1 &= 0.5 \text{ m} \\ T &= 100 \text{ N} \\ \sin \phi &= 0.6 \\ \cos \phi &= 0.8 \end{aligned}$$

α) i) Την T_1 την υπολογίζουμε από την ισορροπία ροπών ως προς (A).

$$\sum \tau_{(A)} = 0 \Rightarrow T_y \cdot d_1 - W \cdot \frac{l}{2} + T_1 \cdot l = 0 \Rightarrow$$

$$T \cdot \sin \phi \cdot d_1 - W \cdot \frac{l}{2} + T_1 \cdot l = 0 \Rightarrow$$

$$80 \cdot 0.5 - 90 \cdot 1 + T_1 \cdot 2 = 0 \Rightarrow$$

$$2T_1 + 40 - 90 = 0 \Rightarrow T_1 = 25 \text{ N}$$

ii) Η δύναμη από την άκρως είναι η F_A .

$$\sum F_x = 0 \Rightarrow F_{Ax} = T_x = T \cdot \cos \phi \Rightarrow F_{Ax} = 80 \text{ N}$$

$$\sum F_y = 0 \Rightarrow F_{Ay} + T_y + T_1 = W \Rightarrow$$

$$F_{Ay} + T \cdot \sin \phi + T_1 = W \Rightarrow$$

$$F_{Ay} + 60 + 25 = 90$$