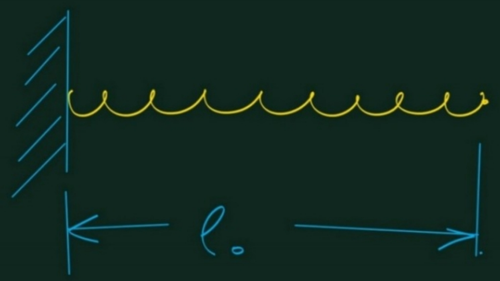
Νόμος Hooke (ελαστική παραμόρφωση)



X = επιμήκυνση = Δl

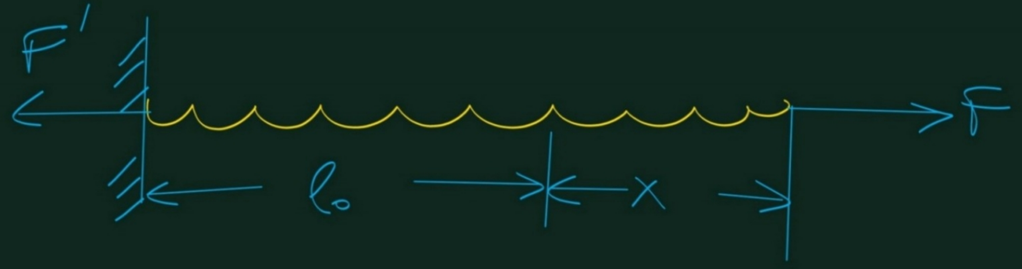
Δl = μεταβολή μήκους (επιμήκυνση ή συσπείρωση)

l_0 = φυσικό μήκος ελατηρίου.

$$F = K \cdot \Delta l$$

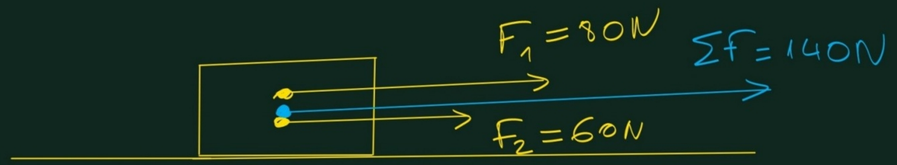
ή

$$F = K \cdot X$$



Ασκ. 1 σελ. 107

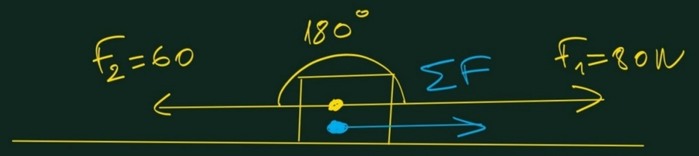
A. $\theta = 0^\circ$



$\Sigma f = f_1 + f_2 = 140N$

B. $\theta = 180^\circ$

(+) →



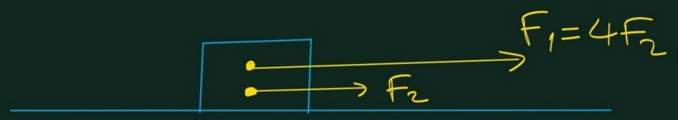
$\Sigma F = f_1 - f_2 = 80 - 20 \Rightarrow$

$\Sigma F = 20N$

Ασκ. 3 σελ. 107

$F = 10\,N$

A.

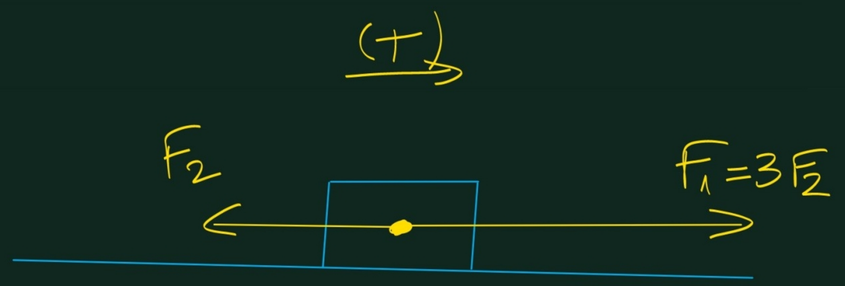


$F = f_1 + f_2 \Rightarrow F = 4f_2 + f_2 \Rightarrow$

$10 = 5F_2 \Rightarrow F_2 = 2N.$

$F_1 = 4F_2 = 8N.$

B.



$F = f_1 - f_2 \Rightarrow$

$F = 3F_2 - F_2 \Rightarrow 10 = 2F_2 \Rightarrow F_2 = 5N$

και $F_1 = 15N.$

Ασκ. 4 | σελ. 107

Α. $F = k \cdot \Delta l = k \cdot x$

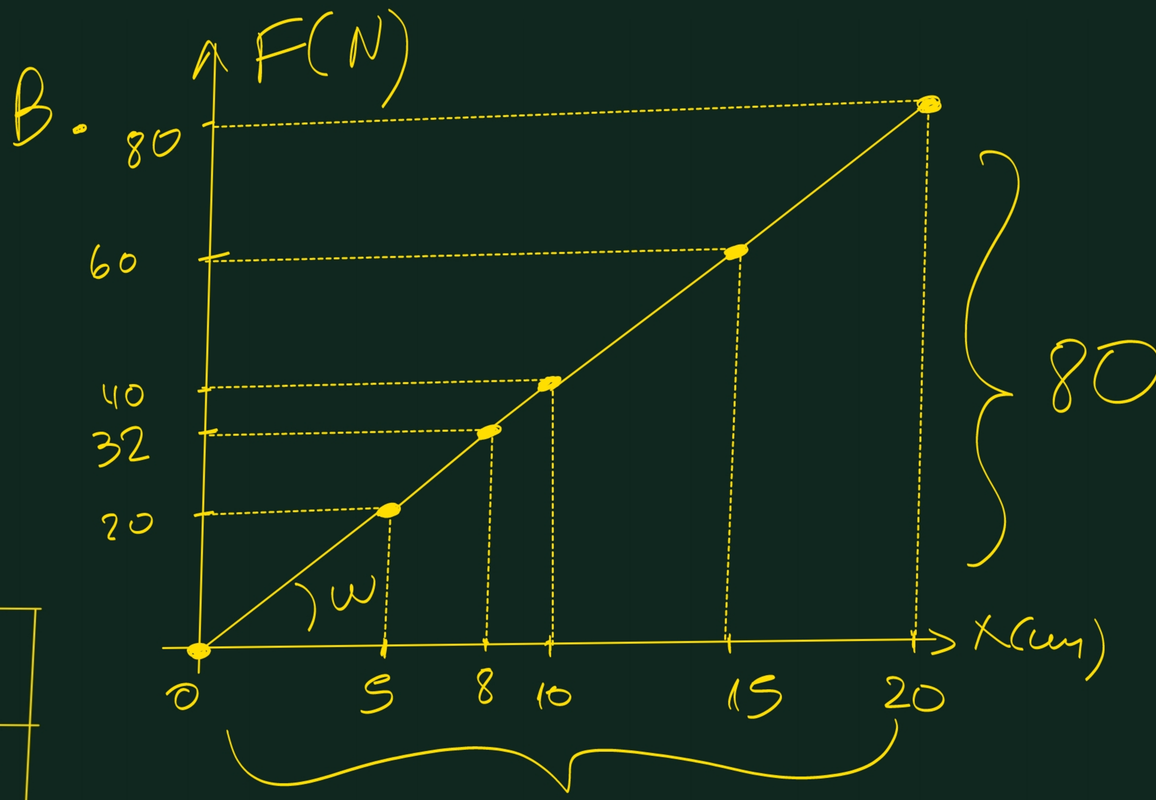
Δl = επιμήκυνση ή συσπείρωση και συμβολίζεται και με x.

Επιμήκυνση (cm)	5	8	10	15	20
Βάρος (N)	20	32	40	60	80

$$\frac{5}{x} = \frac{20}{80} \Rightarrow x = 20$$

$$\frac{8}{x} = \frac{20}{80} \Rightarrow x = 32$$

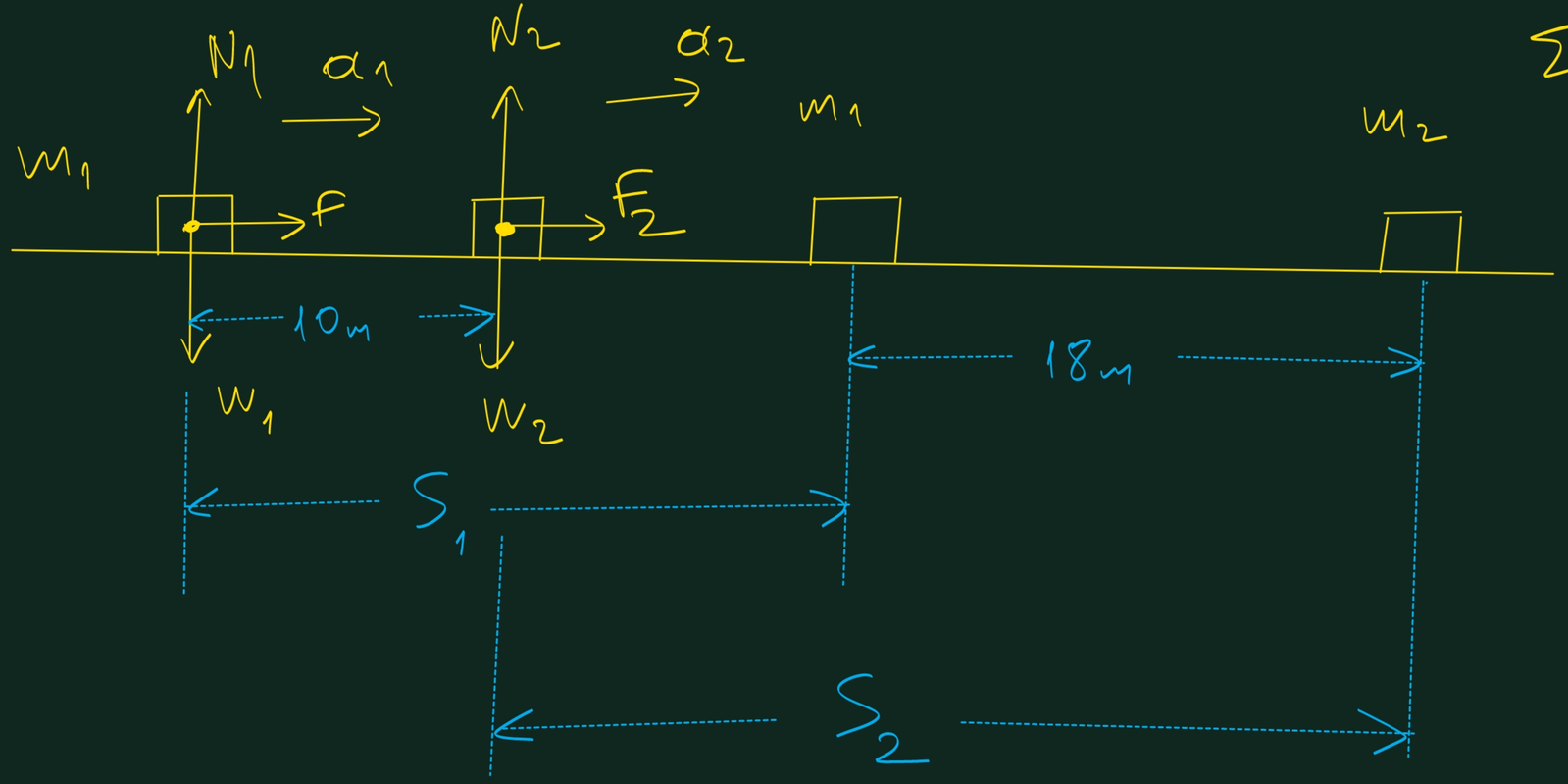
Β.



Γ. $k_{\delta\iota\acute{\alpha}\gamma} = \varepsilon\varphi\omega = \frac{80N}{20cm} = 4\,N/cm$

$\varepsilon\varphi\omega = k = \frac{4N}{cm} = \frac{4N}{0,01m} \Rightarrow k = 400\,N/m$

Ασκ. 11 (σελ. 107-8.)



Α. $\Sigma F_1 = m_1 a_1 \Rightarrow F_1 = m_1 a_1 \Rightarrow a_1 = \frac{F_1}{m_1} \Rightarrow$

$a_1 = \frac{4}{1} \Rightarrow a_1 = 4\,m/s^2$

$\Sigma F_2 = m_2 a_2 \Rightarrow F_2 = m_2 \cdot a_2 \Rightarrow$

$a_2 = \frac{F_2}{m_2} \Rightarrow a_2 = \frac{15}{3} \Rightarrow$

$a_2 = 5\,m/s^2$