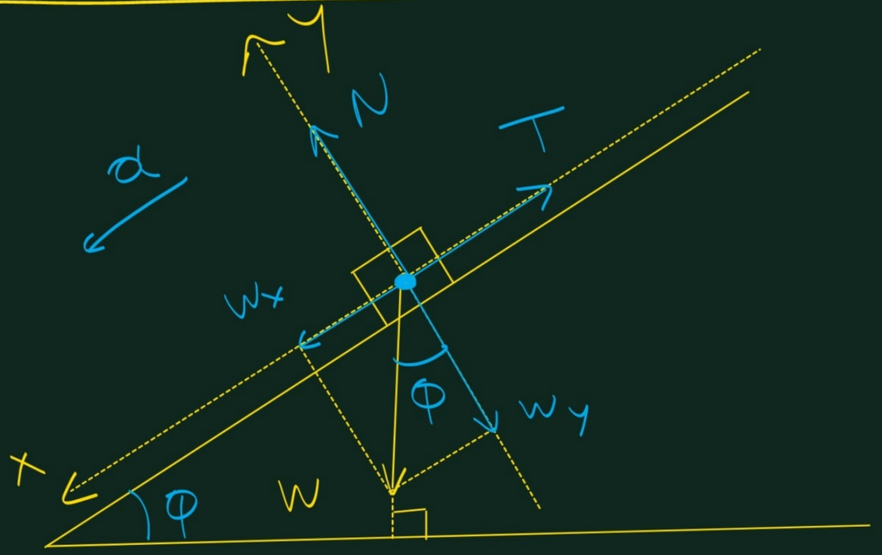
Ασκ. 13 σελ. 158:



α) Στο σώμα ασκούνται τρεις δυνάμεις:
Το βάρος ($W=mg$) από τη Γη.
Η κάθετη δύναμη N από το κεκλιμένο επίπεδο
Η τριβή T " " "

β) $T=\mu N$

$\Sigma F_y=0 \Rightarrow N-W_y=0 \Rightarrow$

$N-W\cdot\sigma\upsilon\nu\varphi=0 \Rightarrow N-mg\sigma\upsilon\nu\varphi=0 \Rightarrow$

$N=1\cdot 10\cdot\sigma\upsilon\nu 30^\circ \Rightarrow N=10\cdot\frac{\sqrt{3}}{2} \Rightarrow N=5\sqrt{3}\,N$

$T=\mu N \Rightarrow T=\frac{\sqrt{3}}{6}\cdot 5\cdot\sqrt{3} \Rightarrow$

$T=\frac{\sqrt{3}^2\cdot 5}{6}=\frac{3\cdot 5}{6}=2{,}5N$

γ) $\Sigma f_x=ma \Rightarrow W_x-T=ma \Rightarrow$

$mg\cdot\eta\mu\varphi-T=ma \Rightarrow$

$1\cdot 10\cdot\eta\mu 30^\circ-2{,}5=1\cdot a \Rightarrow$

$5-2{,}5=a \Rightarrow a=2{,}5\,m/s^2$

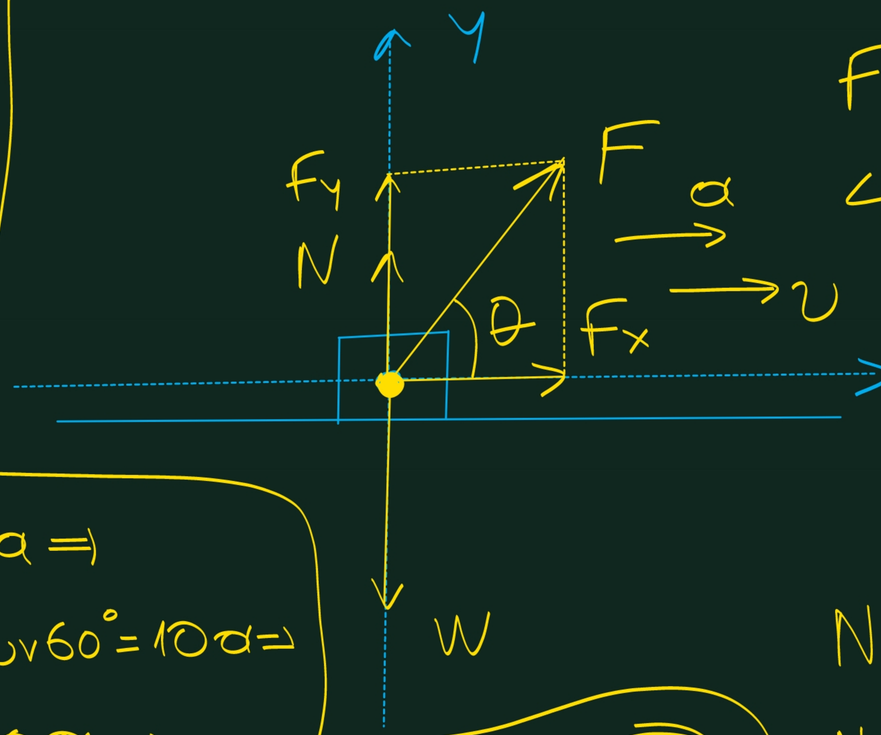
Ασκ. 22 σελ. 159

$S = \frac{1}{2} \cdot a \cdot t^2 \Rightarrow$

$S = \frac{1}{2} \cdot 2{,}5 \cdot 1^2 \Rightarrow$

$S = 1{,}25\,m.$

$\sqrt{3} \simeq 1{,}7$



α) $\Sigma F_y = 0 \Rightarrow$

$F_y + N - W = 0 \Rightarrow$

$F \cdot \text{συν}\theta + N - mg = 0 \Rightarrow$

$40 \cdot \text{συν}60^\circ + N - 10 \cdot 10 = 0 \Rightarrow$

$40 \cdot \frac{\sqrt{3}}{2} + N - 100 = 0 \Rightarrow$

$20\sqrt{3} + N - 100 = 0 \Rightarrow$

$N = 100 - 20\sqrt{3}\ (N)$

$N = 100 - 20 \cdot 1{,}7 \Rightarrow$

$N = 66\,N.$

β) $\Sigma F_x = ma \Rightarrow F_x = ma \Rightarrow$

$F \cdot \text{συν}\theta = ma \Rightarrow 40 \cdot \text{συν}60^\circ = 10a \Rightarrow$

$40 \cdot \frac{1}{2} = 10a \Rightarrow 20 = 10a \Rightarrow$

$a = 2\,m/s^2$

$U = at \Rightarrow U = 2 \cdot 5 \Rightarrow U = 10\,m/s$

γ) 0 → 1 → 2 → 3 → 4 → 5

1° 2° 3° 4° 5°

$S(4) = \frac{1}{2} \cdot 2 \cdot 4^2 = 16\,m$

$S(5) = \frac{1}{2} \cdot 2 \cdot 5^2 = 25\,m$

$S(t) = \frac{1}{2} a t^2$

Άρα: $S_1 = S(5) - S(4) = 25 - 16 = 9\,m$