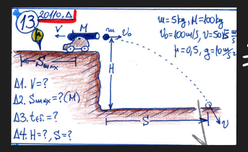
B+1

1ο ΓΕΛ ΣΑΛΑΜΙΝΑΣ



Δ1. ΑΔΟ: $P_{OA}=P'_{OA} \Rightarrow$

$$\cancel{m\cdot 0}+\cancel{M\cdot 0}=m\cdot v_0-M\cdot V \Rightarrow$$

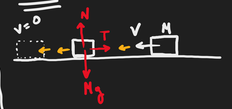
$$\Rightarrow 0=m v_0-M\cdot V \Rightarrow$$

$$\Rightarrow M\cdot V=m v_0 \Rightarrow \boxed{V=\frac{m}{M}v_0} \Rightarrow$$

(6ου νόμου Νιούτωνα)

$$\Rightarrow V=\frac{5}{\cancel{100}}\cdot\cancel{100} \Rightarrow \boxed{V=5\,m/s}$$

Δ2.



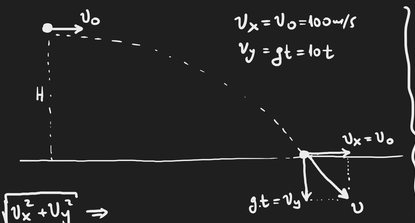
$$T=\mu N=\mu Mg=0{,}5\cdot 100\cdot 10=500\,N$$

$$\alpha=\frac{\Sigma F}{M}=\frac{T}{M}=\frac{500}{100}=5\,m/s^2 \quad (\text{κατ.κρούσ.})$$

(1)

- $S_{max}=\frac{V^2}{2\alpha}=\frac{5^2}{2\cdot 5}=\frac{5}{2} \Rightarrow \boxed{S_{max}=2{,}5\,m}$
- $V'=V-\alpha t \Rightarrow 0=5-5t \Rightarrow 5t=5 \Rightarrow \boxed{t=1\,sec}$ (κρίνουν οι εξισώσεις κίνησης)
- $S_{max}=Vt-\frac{1}{2}\alpha t^2=5\cdot 1-\frac{1}{2}\cdot 5\cdot 1^2=5-2{,}5 \Rightarrow \boxed{S_{max}=2{,}5\,m}$

Δ3.



$v_x=v_0=100\,m/s$

$v_y=gt=10t$

$$v=\sqrt{v_x^2+v_y^2} \Rightarrow$$

$$50\sqrt{5}=\sqrt{100^2+10^2t^2} \Rightarrow$$

$$\Rightarrow 2500\cdot 5=10000+100t^2 \Rightarrow$$

$$\Rightarrow 12500-10000=100t^2 \Rightarrow$$

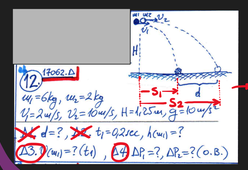
$$\Rightarrow 25\cancel{00}=1\cancel{00}t^2 \Rightarrow t^2=25 \Rightarrow \boxed{t=5\,sec}$$

Δ4.

- $H=\frac{1}{2}gt^2=\frac{1}{2}\cdot 10\cdot 5^2 \Rightarrow$

$$\Rightarrow H=5\cdot 25 \Rightarrow \boxed{H=125\,m}$$

- $S=v_0 t=100\cdot 5 \Rightarrow \boxed{S=500\,m}$

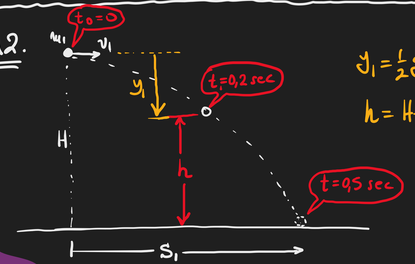


Δ1.

$$H=\frac{1}{2}gt^2 \Rightarrow t=\sqrt{\frac{2H}{g}}=\sqrt{\frac{2\cdot 1{,}25}{10}}=\sqrt{\frac{2{,}5}{10}}=\sqrt{0{,}25}=0{,}5\,sec$$

$$d=S_2-S_1 \Rightarrow d=v_2\cdot t-v_1 t=10\cdot 0{,}5-2\cdot 0{,}5=5-1 \Rightarrow \boxed{d=4\,m}$$

Δ2.



$$y_1=\frac{1}{2}gt_1^2=\frac{1}{2}10\cdot 0{,}2^2=5\cdot 0{,}04=0{,}2\,m$$

$$h=H-y=1{,}25-0{,}2 \Rightarrow \boxed{h=1{,}05\,m}$$