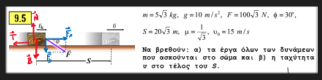
Διόρθωση της 2.5



$m=5\sqrt{3}\ kg,\ g=10\ m/s^2,\ F=100\sqrt{3}\ N,\ \phi=30^\circ,$
$S=20\sqrt{3}\ m,\ \mu=\frac{1}{\sqrt{3}},\ v_0=15\ m/s$

Να βρεθούν: α) τα έργα όλων των δυνάμεων που ασκούνται στο σώμα και β) η ταχύτητα v στο τέλος του S.

$\Sigma F_y=0 \Rightarrow N=B+F_y=w_y+F\cdot\eta\mu\phi=5\sqrt{3}\cdot 10+100\sqrt{3}\cdot\frac{1}{2}=50\sqrt{3}+50\sqrt{3} \Rightarrow \boxed{N=100\sqrt{3}\ N}$

$F_x=F\cdot\sigma\upsilon\nu\phi=100\sqrt{3}\cdot\frac{\sqrt{3}}{2}=50\cdot 3=150\ N$

$F_x=F\cdot\sigma\upsilon\nu\phi=100\sqrt{3}\cdot\frac{1}{2}=50\sqrt{3}\ N$

$T=\mu N=\frac{1}{\sqrt{3}}\cdot 100\sqrt{3} \Rightarrow \boxed{T=100\ N}$

- $W_F=F\cdot S\cdot\sigma\upsilon\nu\phi=100\sqrt{3}\cdot 20\sqrt{3}\cdot\frac{\sqrt{3}}{2}=1000\cdot 3\sqrt{3}=3000\sqrt{3}$ Joule
- $W_B=0\ \ (\vec{B}\perp\vec{S})$
- $W_N=0\ \ (\vec{N}\perp\vec{S})$
- $W_T=-T\cdot S=-100\cdot 20\sqrt{3}=-2000\sqrt{3}$ Joule

$\alpha=\frac{\Sigma F_x}{m}=\frac{F_x-T}{m}=\frac{50\sqrt{3}-100}{5\sqrt{3}}=-1,55\ m/s^2$ (επιβρ.)

$\alpha<\frac{150-100}{5\sqrt{3}}=\frac{50}{5\sqrt{3}} \Rightarrow \alpha<\frac{10}{\sqrt{3}}\ m/s^2<0$

$S=v_0t-\frac{1}{2}|\alpha|\cdot t^2 \Rightarrow 20\sqrt{3}=15\cdot t-\frac{1}{2}1,55t^2 \Rightarrow \boxed{0,775t^2-15t+34,64=0}$

$t=\frac{-\beta\pm\sqrt{\Delta}}{2\alpha}=\dots$ δεκτή, απορ.

$v=v_0-|\alpha|t=\dots$

$20\sqrt{3}=15t+\frac{1}{2}\cdot\frac{10}{\sqrt{3}}t^2 \Rightarrow$

$\cdot\sqrt{3} \Rightarrow 60=15\sqrt{3}t+5t^2 \ \div 5 \Rightarrow \boxed{t^2+3\sqrt{3}t-12=0}$

$\Delta=\beta^2-4\alpha\gamma=(-3\sqrt{3})^2-4\cdot 1\cdot(-12)=$
$=27+48=75$

$t=\frac{-\beta\pm\sqrt{\Delta}}{2\alpha}=\frac{-2\sqrt{3}\pm\sqrt{75}}{2\cdot 1}=\frac{-3\sqrt{3}\pm 5\sqrt{3}}{2} \Rightarrow$

$\Rightarrow t=\begin{cases}\frac{-3\sqrt{3}-5\sqrt{3}}{2}<0 & \text{απορ.}\\ \frac{-3\sqrt{3}+5\sqrt{3}}{2}=\boxed{\sqrt{3}\ sec} & \end{cases}$

$v=v_0+\alpha t=15+\frac{10}{\sqrt{3}}\sqrt{3} \Rightarrow \boxed{v=25\ m/s}$