Α Λυκείου 2016

Θέμα Α A_1-Β, A_2-Γ, A_3-Β, A_4-Γ, A_5, Λ, Σ, Λ, Λ, Σ.

ΘΕΜΑΒ1. Α-β, $\sin\theta > 0$ ή $\sin\theta < 0$.

ΘΕΜΑΒ2. Α - α., Β, εμβαδόν.

ΘΕΜΑΓ. $v_0 = 10\,m/s$.
$t_1 = 10\,s$
$F = 20\,N$.

Γ1) $\Sigma F = 0 \Rightarrow T = 20\,N$.

Γ2) $\Delta x = v_0 \cdot t_1 = 100\,m$.

Γ3) $\Sigma F = F - T = 10\,N$

$$a = \frac{\Sigma F}{m} = \frac{10}{4} = 2{,}5\,m/s^2$$

Γ4) $v = v_0 + a\cdot\Delta t = 10 + 2{,}5\cdot 10 \Rightarrow$

$v = 35\,m/s$.

ΘΕΜΑΔ

Δ1) $E_M = mgh = 0{,}2\cdot 10\cdot 5 = 10\,J$.

$m = 0{,}2\,kg$.
$h = 5\,m$.
$g = 10\,m/s^2$.

Δ2) $K = \frac{1}{2}mv_0^2 \Rightarrow 10 = \frac{1}{2}\cdot 0{,}2\,v^2 \Rightarrow$

$v_0^2 = 100 \Rightarrow v_0 = 10\,m/s$.

Δ3) $E_M = K + U \Rightarrow E_M = 2U \Rightarrow U = \frac{E_M}{2} \Rightarrow mgh = \frac{10}{2} \Rightarrow$

$$h = \frac{10}{2\cdot 0{,}2\cdot 10} \Rightarrow h = \frac{10}{4} \Rightarrow h = 2{,}5\,m.$$

Δ4) $E_M = K + U \Rightarrow E_M = K + \frac{K}{2} \Rightarrow \frac{3K}{2} = E_M \Rightarrow K = \frac{2\cdot 10}{3}$

$$\frac{1}{2}mv^2 = \frac{2\cdot 10}{3} \Rightarrow v^2 = \frac{4\cdot 10}{3\cdot 0{,}2} = \frac{40}{0{,}6} = \frac{400}{6} \Rightarrow$$

$$v = \frac{20\sqrt{6}}{6} \Rightarrow v = \frac{10\sqrt{6}}{3}\,m/s.$$