Ολίσθηση σε κεκλιμένο επίπεδο

α) $\eta\mu\phi = \frac{h}{\Delta x_{cm}} \Rightarrow \Delta x_{cm} = 2h = 4.5\,m$

$\Delta x_{cm} = \frac{v_0^2}{2|a_{cm}|} \Rightarrow |a_{cm}| = \frac{v_0^2}{2\Delta x_{cm}} = 9\,m/s^2$

$\left.\begin{array}{l} \Sigma F_x = m\cdot|a_{cm}| = 9N \\ W_x = mg\eta\mu\phi = 5N \end{array}\right\} \Rightarrow T_{\tau\rho} = 4N.$

β) $\Sigma\tau_{cm} = I\cdot\alpha \Rightarrow T_{\tau\rho}\cdot R = mR^2\cdot\alpha \Rightarrow \alpha\cdot R = \frac{T_{\tau\rho}}{m} = 4\,m/s^2.$

Υανώτερου σημείου $=0 \Rightarrow \omega_0\cdot R = v_0 = 9\,m/s.$

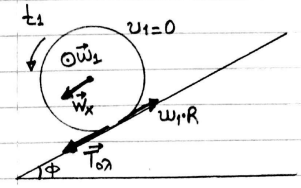
$\Delta t_{STOP\,(C.M.)} = \frac{v_0}{|a_{cm}|} = 1\,sec$

$\Delta t_{STOP\,(στρ.)} = \frac{\omega_0}{|\alpha|} = \frac{\omega_0\cdot R}{|\alpha|\cdot R} = 2.25\,sec.$

άρα την $t_1 = 1sec$: $v_1 = 0$ ενώ $\omega \neq 0$ δηλαδή

$\omega_1 = \omega_0 - |\alpha|\cdot t_1 \Rightarrow \omega_1\cdot R = v_0 - |\alpha|\cdot R\cdot t_1 = 5\,m/s.$

Άρα $K = K_{στ} = \frac{1}{2}mR^2\omega_1^2 = 12.5j$



γ) $E_{ΜΗΧ\,(ΑΡΧ)} = \frac{1}{2}mv_0^2 + \frac{1}{2}mR^2\omega_0^2 = 40.5j + 40.5j = 81j$

$E_{ΜΗΧ\,(ΤΕΛ)} = mgh + K_{στ} = 22.5j + 12.5j = 35j$

$E_{θερμ.} = (81-35)j = 46j$

Κώστας Ψυλάκος