1.32)

$v_1 = -v_0$

$v_2 = v_0$

$v_1' = 2v_0$

$v_2' = 0$

$m_1v_1 + m_2v_2 = m_1v_1' + m_2v_2' \Rightarrow$

$m_1(-v_0) + m_2v_0 = m_1 2v_0 + 0 \Rightarrow$

$m_2v_0 = 3m_1v_0 \Rightarrow$

$m_2 = 3m_1.$

$v_1' = 0$

$v_2' = 2v_0.$

$m_1(-v_0) + m_2v_0 = 0 + m_2 \cdot 2v_0 \Rightarrow$

$-m_1v_0 = m_2v_0 \Rightarrow m_2 = -m_1$ αδύνατο

Άρα σωστό το (γ)

Αν είναι ελαστική ισχύει:

$v_1 + v_1' = v_2 + v_2' \Leftrightarrow$

$-v_0 + 2v_0 = v_0 + 0 \Leftrightarrow$

$v_0 = v_0$ αληθές άρα είναι ελαστική.

Ασκ. 1.34

$\vec{U}_1 = 2\vec{U}_2$ άρα $\vec{U}_1 \uparrow\uparrow \vec{U}_2$ οπότε

αλγεβρικά: $U_1 = 2U_2$

$K_1 + K_2 = K_1' + K_2' \Rightarrow$

$K_1' - K_1 = -(K_2' - K_2) \Rightarrow$

$\Delta K_1 = -\Delta K_2$

$\Pi_1\% = \frac{\Delta K_1}{K_1} \cdot 100\%$

$\Pi_2\% = \frac{\Delta K_2}{K_2} \cdot 100\%$

$\Pi_1\% = -\Pi_2\% \Rightarrow$

$\frac{\Delta K_1}{K_1} \cdot \cancel{100} = -\frac{\Delta K_2}{K_2} \cdot \cancel{100} \Rightarrow$

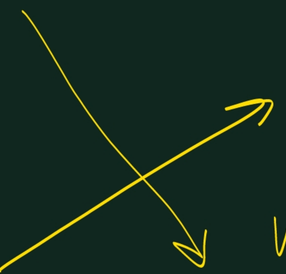
$\frac{\Delta K_1}{K_1} = \frac{-\Delta K_2}{K_2} \Rightarrow K_1 = K_2 \Rightarrow$

$\frac{1}{2} m_1 U_1^2 = \frac{1}{2} m_2 \cdot U_2^2 \Rightarrow m_1 (2U_2)^2 = m_2 U_2^2 \Rightarrow$

$4 m_1 U_2^2 = m_2 U_2^2 \Rightarrow \underline{m_2 = 4 m_1}$

$$v_1' = \frac{m_1 - m_2}{m_1 + m_2} v_1 + \frac{2m_2}{m_2 + m_1} v_2$$

$$v_2' = \frac{2m_1}{m_1 + m_2} \cdot v_1 + \frac{m_2 - m_1}{m_2 + m_1} v_2$$



$$v_1' = \frac{m_1 - 4m_1}{m_1 + 4m_1} v_1 + \frac{2 \cdot 4m_1}{4m_1 + m_1} \cdot \frac{v_1}{2} \Rightarrow$$

$$v_1' = \frac{-3v_1}{5} + \frac{4v_1}{5} = \frac{v_1}{5}$$

Άρα: $\Pi_1\% = \frac{\Delta K_1}{K_1} \cdot 100 =$

$$= \frac{\frac{1}{2} m_1 v_1'^2 - \frac{1}{2} m_1 v_1^2}{\frac{1}{2} m_1 v_1^2} \cdot 100 =$$

$$= \frac{v_1'^2 - v_1^2}{v_1^2} \cdot 100 = \frac{\left(\frac{v_1}{5}\right)^2 - v_1^2}{v_1^2} \cdot 100 =$$

$$= \frac{\frac{v_1^2}{25} - \frac{25v_1^2}{25}}{v_1^2} \cdot 100 = -\frac{24}{25} \cdot 100 =$$

$$= -96\%$$

Σωστό το (γ).

Ασκ. 1.59

α) $m_1 g l = \frac{1}{2} m_1 v_1^2 \Rightarrow$

$v_1 = \sqrt{2 \cdot 10 \cdot 1{,}25} = 5 \text{ m/s}.$

$T - mg = \frac{m v_1^2}{l} \Rightarrow$

$T - 20 = \frac{2 \cdot 25}{1{,}25} \Rightarrow$

$T - 20 = 40 \Rightarrow$

$T = 60 \text{ N}$

β) $Q = T \cdot \Delta l = \gamma m g \cdot \Delta l \Rightarrow$

$15 = 0{,}5 \cdot 3 \cdot 10 \cdot \Delta l \Rightarrow$

$\Delta l = 1 \text{ m}.$

$U_{\varepsilon\lambda,max} = \frac{1}{2} k \cdot \Delta l^2 = \frac{1}{2} \cdot 18 \cdot 1^2 = 9 \text{ J}.$

γ) $0 - \frac{1}{2} m_2 v_2'^2 = W_{F_{\varepsilon\lambda}} + W_T = 0 - \frac{1}{2} k \cdot \Delta l^2 - T \cdot \Delta l \Rightarrow$

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