

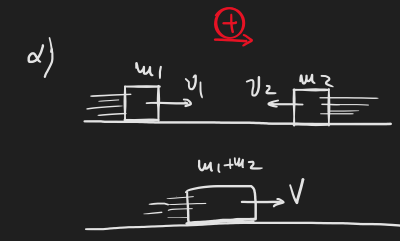
TP 22.12.2020

B+2

10.12



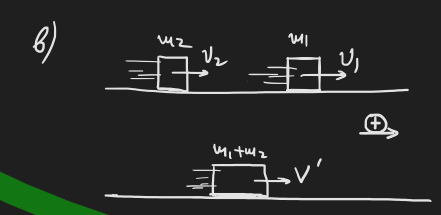
III
a) $m_1 = 10 \text{ kg}$
 $m_2 = 20 \text{ kg}$
 $v_1 = 2 \text{ m/s}$ (right)
 $v_2 = 5 \text{ m/s}$ (left)
Ρυθμιζόμενη κρούση
b) $V = ?$ ($\Delta K = ?$)
c) $V' = ?$ ($\vec{v}_1, \vec{v}_2, \vec{v}'$) ($\Delta K' = ?$)



ορμή:
 $P_1 = m_1 v_1 = 10 \cdot 2 = 20 \text{ kg} \cdot \text{m/s}$
 $P_2 = m_2 v_2 = 20 \cdot 5 = 100 \text{ kg} \cdot \text{m/s}$
 $P_2 > P_1$
Σημ: το συσσωματωμένο θα κινηθεί
προς την αριστερά του m2
...o

ΑΔΟ: $\vec{P}_1 + \vec{P}_2 = \vec{P}_{\text{συσ}} \Rightarrow$
 $\Rightarrow \vec{P}_1 + (-\vec{P}_2) = \vec{P}_{\text{συσ}} \Rightarrow$
 $\Rightarrow m_1 v_1 - m_2 v_2 = (m_1 + m_2) V \Rightarrow$
 $\Rightarrow 10 \cdot 2 - 20 \cdot 5 = (10 + 20) \cdot V \Rightarrow$
 $\Rightarrow 20 - 100 = 30 V \Rightarrow$
 $\Rightarrow -80 = 30 V \Rightarrow$
 $\Rightarrow V = -8/3 \text{ m/s}$
Σημ: η $V = 8/3 \text{ m/s}$ ή η φορά
αριστερά και όχι zur rechts, ή η
ή η φορά: προς τα αριστερά

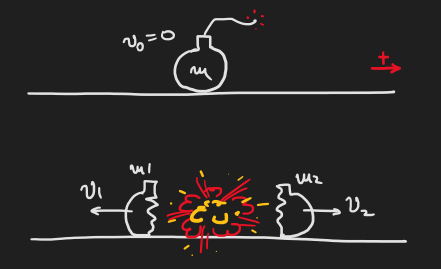
μεταβολή
 $\Delta K = K_{\text{αφ}} - K_{\text{πρ}} = K_{\text{συσ}} - (K_1 + K_2) =$
 $= \frac{1}{2} (m_1 + m_2) V^2 - \left(\frac{1}{2} m_1 v_1^2 + \frac{1}{2} m_2 v_2^2 \right) =$
 $= \frac{1}{2} (10 + 20) \left(\frac{8}{3} \right)^2 - \left(\frac{1}{2} \cdot 10 \cdot 2^2 + \frac{1}{2} \cdot 20 \cdot 5^2 \right) =$
 $= \frac{1}{2} \cdot 30 \cdot \frac{64}{9} - \frac{1}{2} \cdot 10 \cdot 4 - \frac{1}{2} \cdot 20 \cdot 25 = -163,33 \text{ Joule}$
 $|\Delta K| = 163,33 \text{ Joule}$
αριστερά



ΑΔΟ: $\vec{P}_{\text{αφ}} = \vec{P}_{\text{πρ}} \Rightarrow \vec{P}_1 + \vec{P}_2 = \vec{P}_{\text{συσ}} \Rightarrow$
 $\Rightarrow \vec{P}_1 + \vec{P}_2 = \vec{P}_{\text{συσ}} \Rightarrow m_1 v_1 + m_2 v_2 = (m_1 + m_2) V' \Rightarrow$
 $\Rightarrow 10 \cdot 2 + 20 \cdot 5 = (10 + 20) V' \Rightarrow$
 $\Rightarrow 20 + 100 = 30 \cdot V' \Rightarrow 120 = 30 \cdot V' \Rightarrow$
 $\Rightarrow V' = 4 \text{ m/s}$

$\Delta K' = K_{\text{αφ}} - K_{\text{πρ}} = \frac{1}{2} (m_1 + m_2) V'^2 - \left(\frac{1}{2} m_1 v_1^2 + \frac{1}{2} m_2 v_2^2 \right) =$
 $= \frac{1}{2} (10 + 20) \cdot 4^2 - \left(\frac{1}{2} \cdot 10 \cdot 2^2 + \frac{1}{2} \cdot 20 \cdot 5^2 \right) =$
 $= 240 - (20 + 250) = -30 \text{ Joule}$
 $|\Delta K'| = 30 \text{ Joule}$

III
10) $m = 100 \text{ kg}$
 $m_1 = 3m_2$ $\leadsto$ $m_2 = 75 \text{ kg}$
 $v_0 = 0$
 $v_2 = 150 \text{ m/s}$
 $v_1 = ?$



ΑΔΟ: $\vec{P}_{\text{αφ}} = \vec{P}_{\text{πρ}} \Rightarrow$
 $\Rightarrow \vec{P}_{\text{αφ}} = \vec{P}_{m_1} + \vec{P}_{m_2} \Rightarrow$
 $\Rightarrow 0 = -P_{m_1} + P_{m_2} \Rightarrow$
 $\Rightarrow 0 = -m_1 v_1 + m_2 v_2 \Rightarrow$
 $\Rightarrow m_1 v_1 = m_2 v_2 \Rightarrow$
 $\Rightarrow 3m_1 v_1 = m_2 v_2 \Rightarrow$
 $\Rightarrow v_1 = 450 \text{ m/s}$

20 upojoino Next Year !!!

merry X-mas