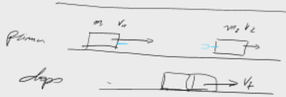
Urto anelastico

$q_1 + q_2 = q_f$

$m_1 v_1 + m_2 v_2 = (m_1 + m_2) \cdot v_f$

URTO ELASTICO

$$\begin{cases} m_1 v_1 + m_2 v_2 = m_1 v_{1f} + m_2 v_{2f} \\ \frac{1}{2} m v_1^2 + \frac{1}{2} m v_2^2 = \frac{1}{2} m_1 v_{1f}^2 + \frac{1}{2} m_2 v_{2f} \end{cases}$$



$v_1 > v_2$

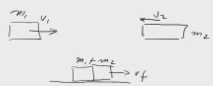
URTO ANELASTICO

$$\begin{cases} m_1 = 600\ g \\ v_1 = 3\ m/s \\ m_2 = 500\ g \\ v_2 = 1\ m/s \end{cases}$$

$m_1 v_1 + m_2 v_2 = (m_1 + m_2) \cdot v$

$0{,}6 \cdot 3 + 0{,}5 \cdot 1 = (0{,}4 + 0{,}5) \cdot v_f$

$1{,}7 = 0{,}9 \cdot v_f$ $\quad v_f = \frac{1{,}7}{0{,}9} = 1{,}88\ m/s$

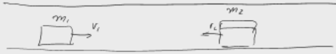


$$\begin{cases} m_1 = 400\ g \\ v_1 = 3\ m/s \\ m_2 = 500\ g \\ v_2 = -1\ m/s \end{cases}$$

$m_1 v_1 - m_2 v_2 = (m_1 + m_2) \cdot v_f$

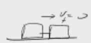
$0{,}4 \cdot 3 - 0{,}5 \cdot 1 = 0{,}9 \cdot v_f$

$0{,}7 = 0{,}9\, v_f$ $\quad v_f = \frac{0{,}7}{0{,}9} = 0{,}77\ m/s$



$m_1 = 400\ g$ $\quad m_2 = 800\ g$

$v_1 = 8\ m/s$ $\quad v_2 = 4\ m/s$



$m_1 v_1 - m_2 v_2 = (m_1 + m) \cdot v_f$

$0{,}4 \cdot 8 - 0{,}8 \cdot 4 = 1{,}2 \cdot v_f$

$\emptyset = 1{,}2\ v_f \Rightarrow \boxed{v_f = 0}$

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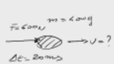
11 pg 833



$F \cdot \Delta T = m \Delta v$

$\Delta v = \frac{F \Delta T}{m} = \frac{600 \cdot \frac{20}{1000}}{0{,}4} = 30\ m/s$

1° Metodo

Dinamica $\quad$ 2° Metodo

$F = m a$ $\quad a = \frac{F}{m} = \frac{600}{0{,}4} = 1500\ m/s^2$

$v_f = a t = 1500 \cdot \frac{20}{1000} = 30\ m/s$