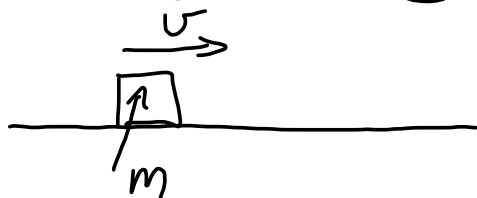


Bevægelses mengde



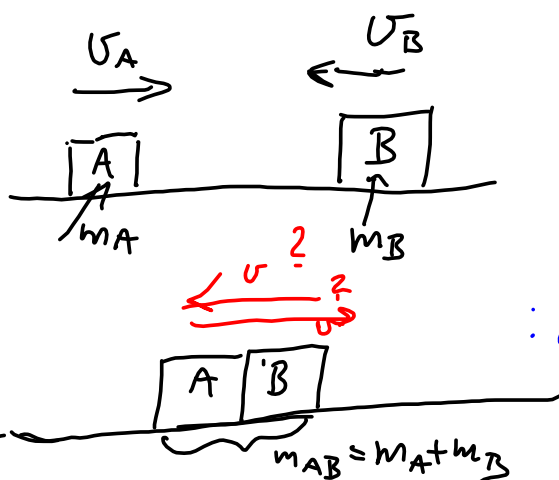
$$p = m \cdot v$$

↑ *bevegelsesmengde*

↑ *masse* ↓ *fart*

↑ *beveerelse*

$[kg \cdot m/s]$



: Før

: Etter

Den totale bevegelsesmengden "før" er lik den totale bevegelsesmengde "etter"

Den totale bevegelsesmengden før:

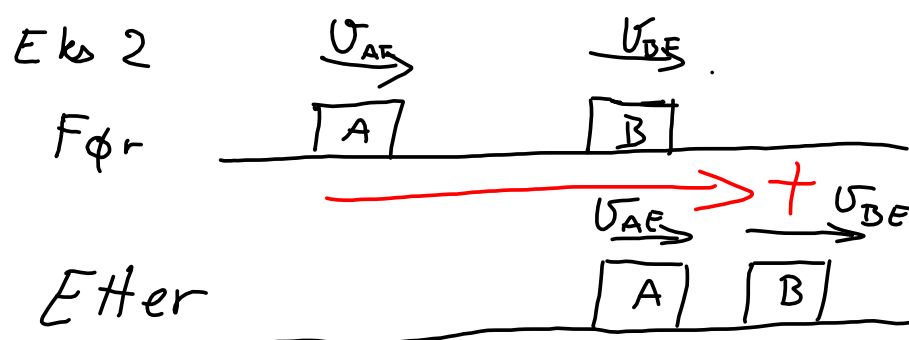
$$p_{tf} = m_A \cdot v_{Af} + m_B \cdot v_{Bf}$$

Etter

$$p_{te} = m_{AB} \cdot v_{ABe}$$

(← når de henger sammen)

$$m_A \cdot v_{Af} + m_B \cdot v_{Bf} = m_{AB} \cdot v_{ABe}$$



$$m_A \cdot v_{AF} + m_B \cdot v_{BF} = m_A \cdot v_{AE} + m_B \cdot v_{BE}$$

Bevegelsesmengde før

Bevegelsesmengde etter

5.01

$$m_1 = 50 \text{ kg} \quad m_2 = 80 \text{ kg}$$

$$a) \quad p = m_1 \cdot v_1 = 50 [\text{kg}] \cdot 8,0 [\text{m/s}] = 400 [\text{kg} \cdot \text{m/s}]$$

$$b) \quad v_2 = \frac{p}{m_2} = \frac{400 [\text{kg} \cdot \text{m/s}]}{80 [\text{kg}]} = 5,0 [\text{m/s}]$$

$$\text{Før: } m_1 \cdot v_{1F} + m_2 \cdot v_{2F} = 0$$

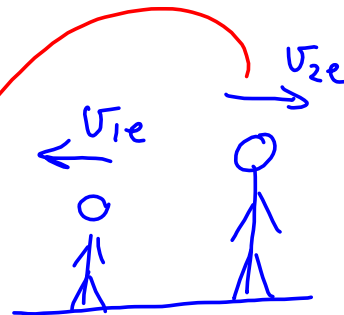
$$p_F = 0 \quad (\text{da } v_{1F} = v_{2F} = 0)$$

$$m_1 \cdot v_{1F} = -m_2 \cdot v_{2F}$$

$$\text{Etter: } p_e = p_F = 0$$

$$m_1 \cdot v_{1e} + m_2 \cdot v_{2e} = 0$$

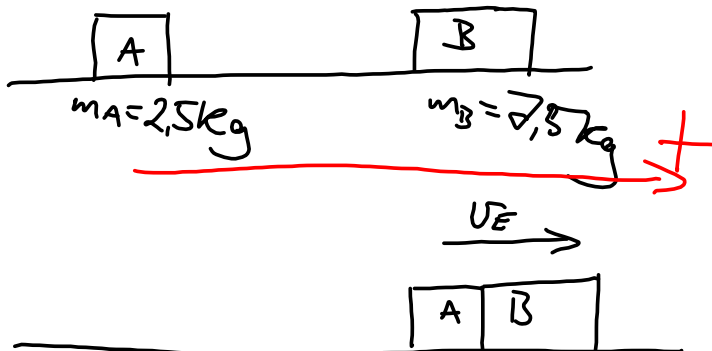
$$m_1 \cdot v_{1e} = -m_2 \cdot v_{2e}$$



5.02

$$v_{AF} = 5,0 \text{ m/s}$$

$$v_{BF} = 0$$



$$m_A \cdot v_{AF} + m_B \cdot v_{BF} = m_{AB} \cdot v_E$$

$$v_E = \frac{m_A \cdot v_{AF}}{m_{AB}} = \frac{2,5 \cdot 5,0 \text{ [kg} \cdot \text{m/s]}}{10,0 \text{ [kg]}} = 1,25 \text{ [m/s]} = 1,3 \text{ [m/s]}$$

Støt

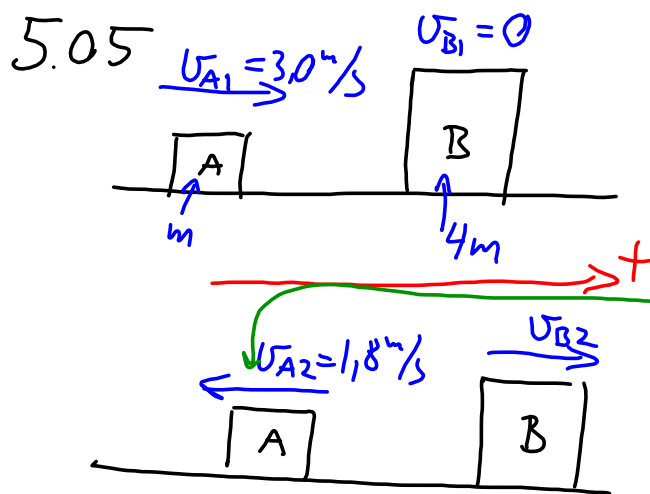
Elastisk støt:

Der er kinetisk energi før
lik kinetisk energi etter

Uelastisk støt

Der er den kinetiske energien før
ikke lik den kinetiske energien etter

$$E_k = \frac{1}{2} m v^2$$



a) $m \cdot v_{A1} + 4m \cdot v_{B1} = m \cdot v_{A2} + 4m \cdot v_{B2}$

$$4v_B = v_{A1} - v_{A2} = 3.0 \text{ [m/s]} - (-1.8 \text{ [m/s]})$$

$$4v_B = 4.8 \text{ [m/s]}$$

$$v_B = \frac{4.8}{4} = 1.2 \text{ [m/s]}$$

b) $E_{K1} = E_{A1} + E_{B1} = \frac{1}{2} m v_{A1}^2 + \frac{1}{2} 4m \cdot v_{B1}^2$

$$= \frac{1}{2} m 3.0^2 = 4.5 \cdot m$$

E_{K1}
Før

$$E_{K2} = E_{A2} + E_{B2} = \frac{1}{2} m v_{A2}^2 + \frac{1}{2} 4m \cdot v_{B2}^2$$

$$= \frac{1}{2} m (1.8)^2 + \frac{1}{2} \cdot 4m \cdot 1.2^2 = 4.5 m$$

$$E_{K1} = E_{K2} \Rightarrow \text{Elastisk st\u00f8t}$$