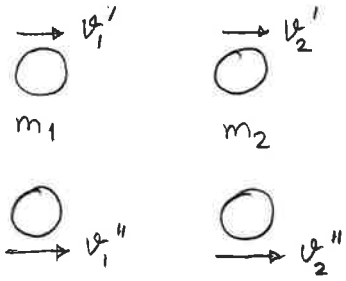
1)

Stötförlopp:



Samband:
- * Rörelsem. bevaras
- ** $e = 0{,}6$

* $(\rightarrow)$ $m_1 v_1' + m_2 v_2' = m_1 v_1'' + m_2 v_2''$ ... (1)

** $e = \dfrac{v_2'' - v_1''}{v_1' - v_2'} = 0.6$; $0.6(5-3)\ \text{m/s} = v_2'' - v_1''$;

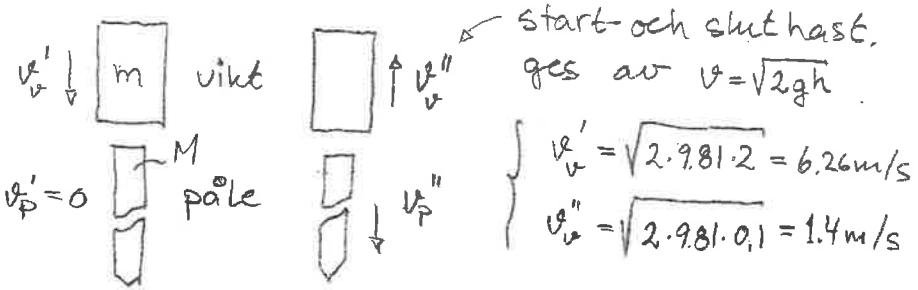
$v_2'' = 1.2 + v_1''$ ... (2)

(2) insatt i (1) $\Rightarrow$

$3 \cdot 5 + 5 \cdot 3 = 3 \cdot v_1'' + 5 \cdot (1.2 + v_1'') \Rightarrow v_1'' = 3.0\ \text{m/s}$

(2) $\Rightarrow$ $v_2'' = 4.2\ \text{m/s}$

2)



* Rörelsemängden bevaras:

$(\downarrow)$ $m v_v' + \underbrace{M v_p'}_{0} = -m \cdot v_v'' + M v_p''$; $v_p'' = \dfrac{m}{M}(v_v' + v_v'')$;

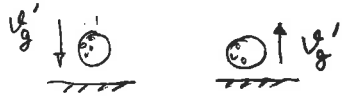
$v_p'' = \dfrac{800}{2400} \cdot (6.26 + 1.4) = 2.55\ \text{m/s}$

* stöttalet $e = \dfrac{|\Delta v_{\text{efter}}|}{|\Delta v_{\text{före}}|} = \dfrac{v_v'' + v_p''}{v_v'} = \dfrac{1.4 + 2.55}{6.26} =$

$= 0.63$

3) Max höjd då $e=1$ (idealisering)

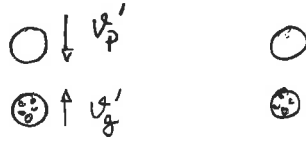
<u>Stöt 1</u> : Golfboll mot golv med <u>$e=1$</u> ⇒



Samma fart $v_g' = \sqrt{2gh}$

$v_g' = \sqrt{2 \cdot 9.81 \cdot 1} = 4{,}43 \text{ m/s}$

<u>stöt 2</u> : Golfboll mot pingisboll



$(v_p' = v_g')$

Rörelsemängden bevaras :

$$(\uparrow) \quad m_g \cdot v_g' - m_p v_p' = m_g v_g'' + m_p v_p''$$

$m_g >> m_p \Rightarrow v_g'' = v_g' = 4{,}43 \text{ m/s}$

Stöt koeff. ($e=1$) :

$$e = \frac{v_p'' - v_g''}{v_g' + v_p'} = 1 \; ; \quad v_p'' = v_g'' + v_g' + v_p' \; ;$$

$v_p'' = 3 \cdot 4{,}43 \text{ m/s} = 13{,}3 \text{ m/s}$

Höjden : $v_p'' = \sqrt{2gh} \; ; \quad h = \frac{(v_p'')^2}{2g} = 9 \text{ m}$