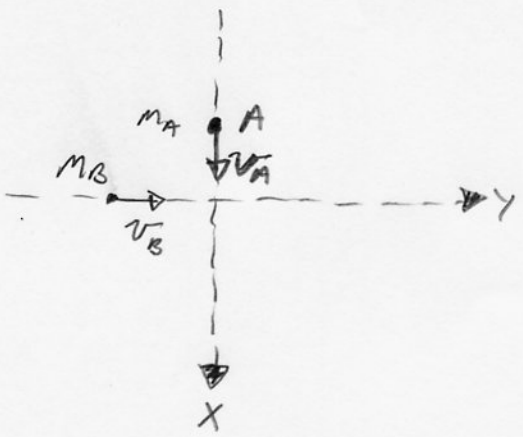
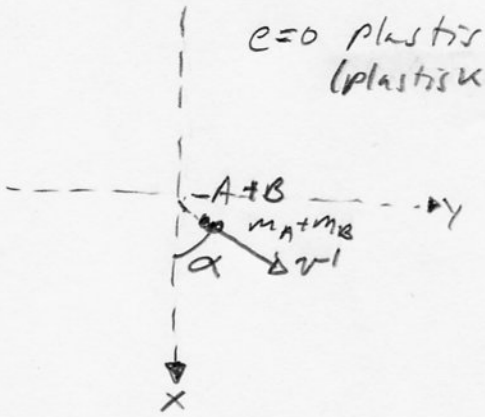
11.15

Före stöt



Efter stöt

e=0 plastisk stöt (plastisk kollision)



$\bar{v}_{Af} = v_A \bar{e}_x$

$\bar{v}_{Bf} = v_B \bar{e}_y$

$\bar{v}_{Ae} = v' \cos\alpha \bar{e}_x + v' \sin\alpha \bar{e}_y$

$\bar{v}_{Be} = v' \cos\alpha \bar{e}_x + v' \sin\alpha \bar{e}_y$

$\bar{v}_{Ae} = \bar{v}_{Be}$

Rörelsemängden bevaras

$$\bar{p}_{Af} + \bar{p}_{Bf} = \bar{p}_{Ae} + \bar{p}_{Be}$$

$\downarrow x$: $m_A v_A + 0 = (m_A + m_B) v' \cos\alpha$ (1)

$\rightarrow y$: $0 + m_B v_B = (m_A + m_B) v' \sin\alpha$ (2)

$\frac{(2)}{(1)}$: $\boxed{\tan\alpha = \frac{m_B v_B}{m_A v_A}}$

$(1)^2 + (2)^2$: $m_A^2 v_A^2 + m_B^2 v_B^2 = (m_A + m_B)^2 (v')^2 \underbrace{(\cos^2\alpha + \sin^2\alpha)}_{1}$

$$\boxed{v' = \frac{\sqrt{m_A^2 v_A^2 + m_B^2 v_B^2}}{m_A + m_B}}$$

GK.