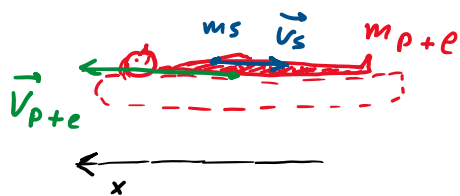


7.10.



Si on admet que $\sum \vec{F}_{ext} = \vec{0}$, alors

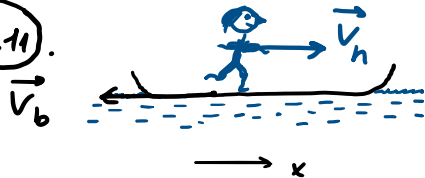
$$\vec{p}_i = \vec{p}_f = \vec{0}$$

$$\Rightarrow \begin{cases} \vec{p}_i = \vec{0} & (\text{avant l'impulsion du cœur}) \\ \vec{p}_f = m_{p+e} \cdot \vec{v}_{p+e} + m_s \cdot \vec{v}_s \end{cases}$$

Sur x: $-m_{p+e} \cdot v_{p+e} + m_s \cdot v_s = 0$

$$\Rightarrow v_{p+e} = \frac{m_s}{m_{p+e}} \cdot v_s = \frac{0,05}{85} \cdot 0,25 = \underline{\underline{1,6 \cdot 10^{-4} \text{ m/s}}}$$

7.11.



$$m_n = 55 \text{ kg}$$

$$m_b = 210 \text{ kg}$$

S: $\sum \vec{F}_{ext} = \vec{0} \Rightarrow \vec{p}_i = \vec{p}_f = \vec{0}$

$$\vec{p}_i = \vec{0} \text{ au repos}$$

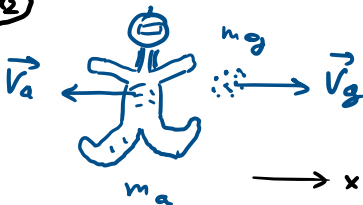
(a).

$$\vec{p}_f = m_b \cdot \vec{v}_b + m_n \cdot \vec{v}_n = \vec{0}$$

Sur x: $-m_b \cdot v_b + m_n \cdot v_n = 0 \Rightarrow v_b = \frac{m_n}{m_b} \cdot v_n = \frac{55}{210} \cdot 4,6 = \underline{\underline{1,2 \text{ m/s}}}$

(b). $\vec{J}_b = \vec{p}_b = m_b \vec{v}_b \Rightarrow J_b = m_b \cdot v_b = \underline{\underline{2,5 \cdot 10^2 \text{ kg} \cdot \frac{\text{m}}{\text{s}}}}$

7.12



S: $\sum \vec{F}_{ext} = \vec{0} \Rightarrow \vec{p}_i = \vec{p}_f = \vec{0}$

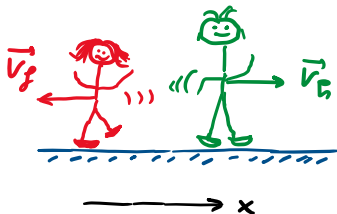
$$\vec{p}_i = \vec{0} \text{ avant l'éjection}$$

$$\vec{p}_f = m_a \cdot \vec{v}_a + m_g \cdot \vec{v}_g$$

Sur x: $m_g \cdot v_g - m_a \cdot v_a = 0$

$$v_a = \frac{m_g}{m_a} \cdot v_g = \frac{0,30}{90} \cdot 15 = \underline{\underline{5,0 \cdot 10^{-2} \text{ m/s}}}$$

7.13



S: $\sum \vec{F}_{ext} = \vec{0} \Rightarrow \vec{p}_i = \vec{p}_f = \vec{0}$

$$\vec{p}_i = \vec{0} \text{ avant l'impulsion}$$

(a). $\vec{p}_f = m_f \cdot \vec{v}_f + m_R \cdot \vec{v}_R = \vec{0}$

Sur x: $-m_f \cdot v_f + m_R \cdot v_R = 0$

$$\Rightarrow v_R = \frac{m_f}{m_R} \cdot v_f = \frac{54}{88} \cdot 12,5 = \underline{\underline{7,7 \text{ m/s}}}$$

(b). $\frac{E_{cin R}}{E_{cin f}} = \frac{\frac{1}{2} m_R \cdot v_R^2}{\frac{1}{2} m_f \cdot v_f^2} = \frac{m_R}{m_f} \cdot \left(\frac{m_f}{m_R} \right) \cdot \frac{v_f^2}{v_f^2} = \frac{m_R}{m_f}$