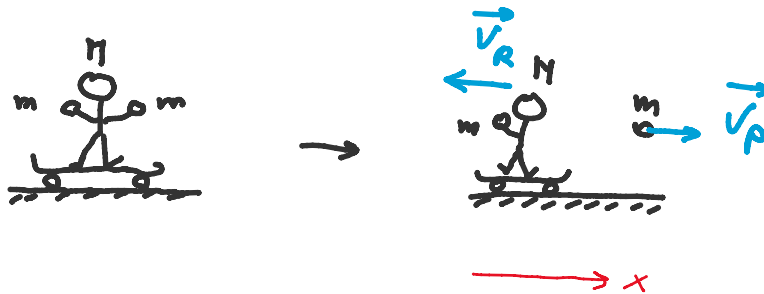


Exercice 7.46

vendredi, 30 avril 2021 11:12

a).



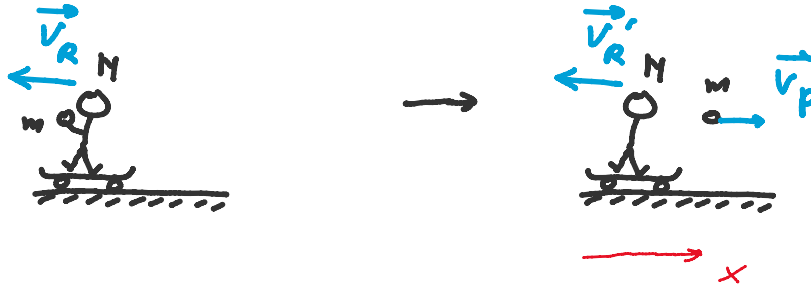
• le système garçon + pécues + board est isolé

$$\Rightarrow \vec{P}_i = \vec{P}_f$$

$$\vec{0} = (m+M)\vec{v}_R + m\vec{v}_P \Rightarrow \text{sur } x: 0 = -(m+M)v_R + mv_P$$

$$\Rightarrow v_R = \frac{m}{m+M} v_P = \frac{3}{78} 14 \approx \underline{\underline{0,54 \text{ m/s}}}$$

b).



$$\vec{P}_i = \vec{P}_f$$

$$(m+M)\vec{v}_R = M\vec{v}_{R'} + m\vec{v}_P$$

$$\text{sur } x: -(m+M)v_R = -Mv_{R'} + mv_P$$

$$\Rightarrow v_{R'} = \frac{mv_P + (m+M)v_R}{M} = \frac{3 \cdot 14 + 78 \cdot 0,54}{75} \approx \underline{\underline{1,1 \text{ m/s}}}$$

c). Dans ce cas, on aurait: $\vec{P}_i = \vec{P}_f \Rightarrow \vec{0} = M\vec{v}_{R''} + 2m\vec{v}_P$

$$\text{sur } x: 0 = -Mv_{R''} + 2mv_P \Rightarrow v_{R''} = \frac{2m}{M} v_P = v_{R'}$$

$\Rightarrow$ même vitesse !