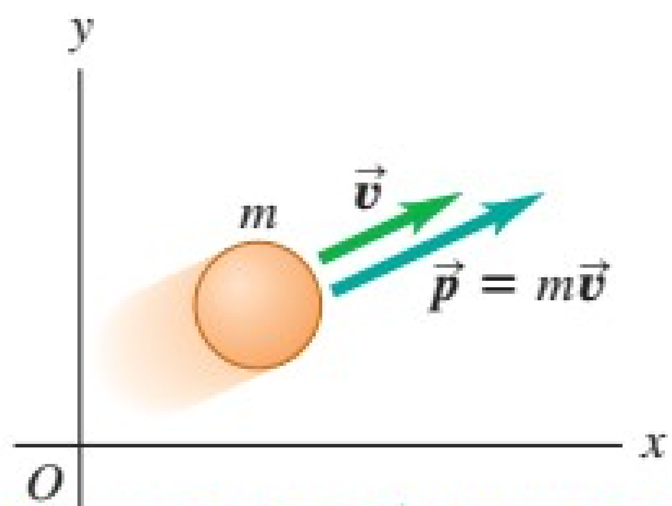
IMPULSO Y CANTIDAD DE MOVIMIENTO

$$\sum \vec{F} = m\frac{d\vec{v}}{dt} = \frac{d}{dt}(m\vec{v})$$

$$\vec{p} = m\vec{v}$$

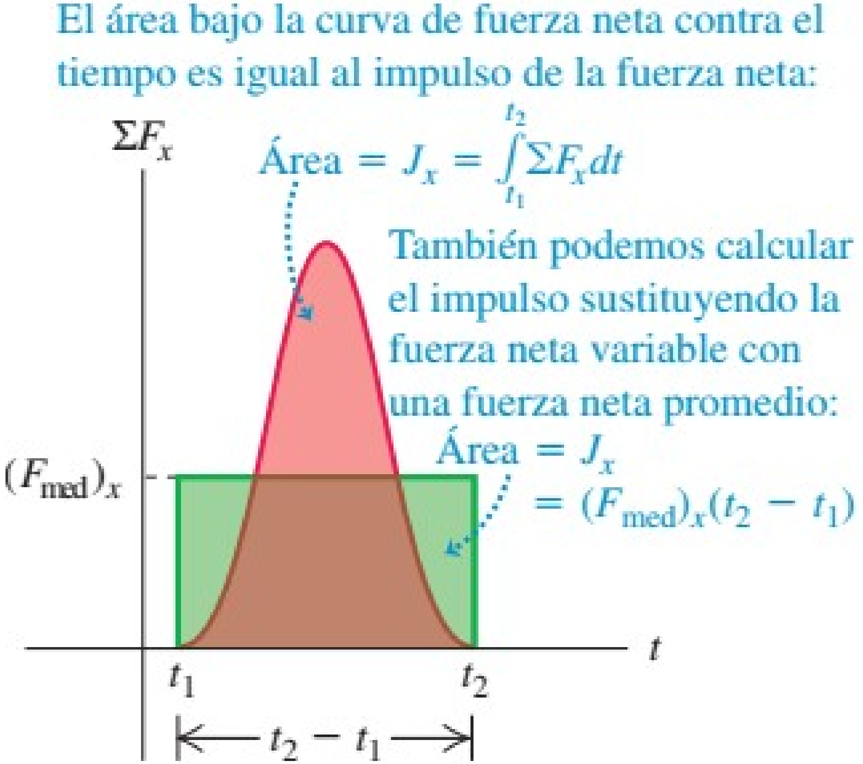
8.1 Los vectores de velocidad y de momento lineal de una partícula.

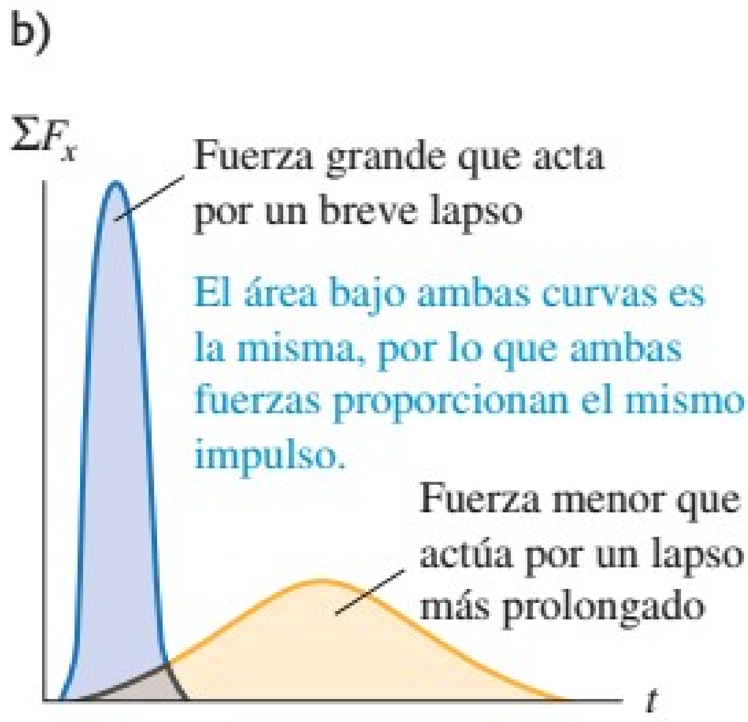


El momento lineal $\vec{p}$ es una cantidad vectorial; el momento lineal de una partícula tiene el mismo sentido que su velocidad $\vec{v}$.

Teorema del impulso y el momento lineal

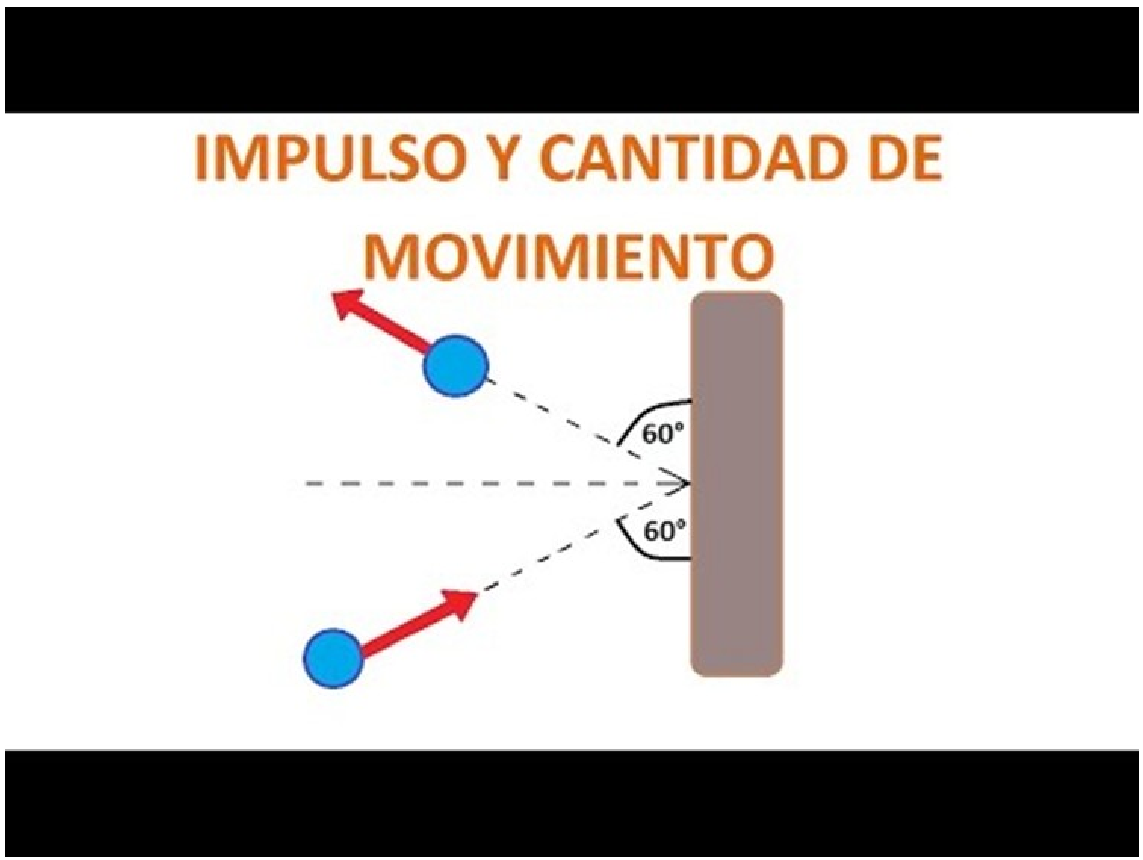
$$\vec{J} = \sum \vec{F}(t_2 - t_1) = \sum \vec{F}\,\Delta t$$

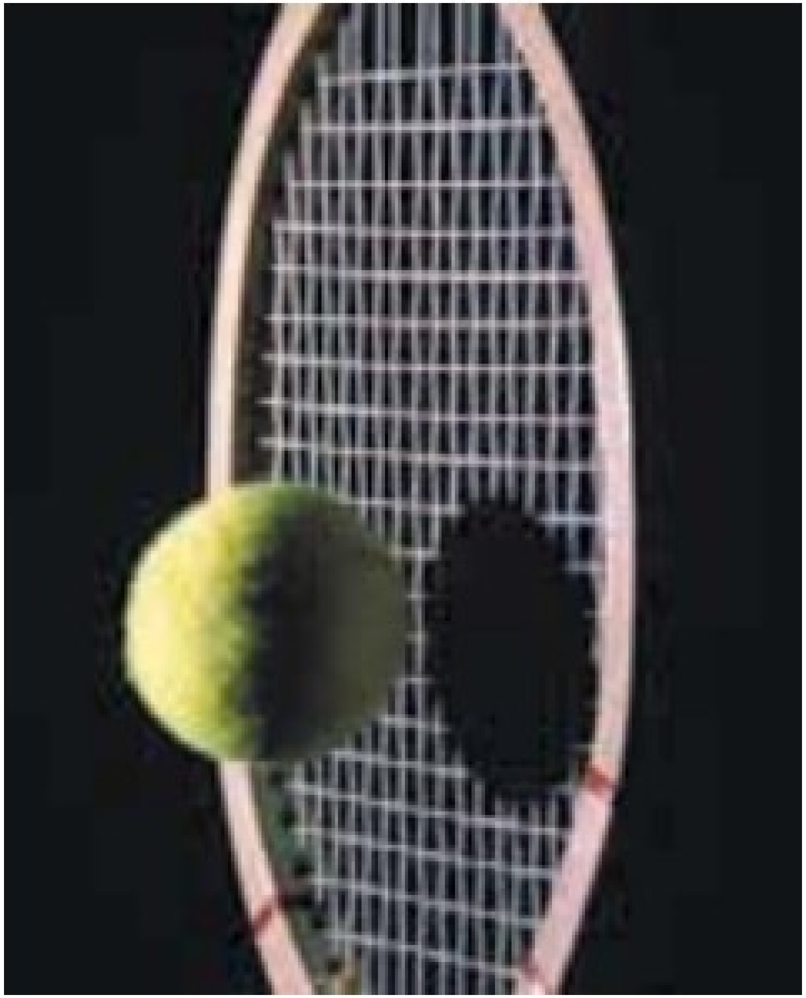
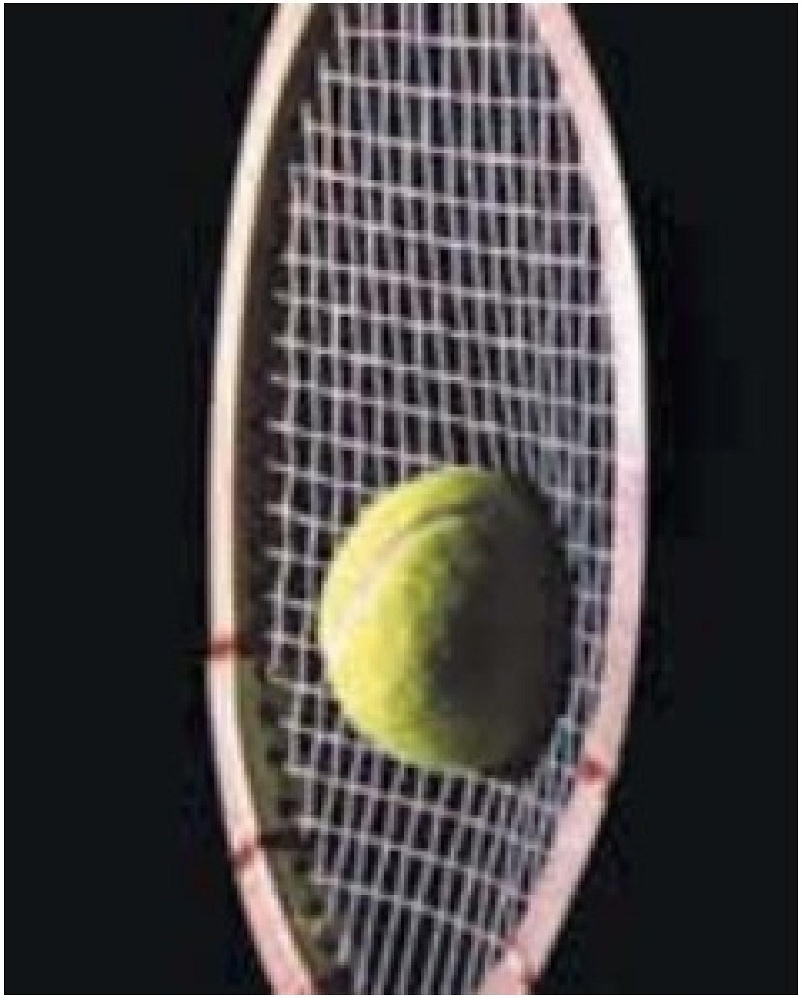




$$\sum \vec{F}(t_2 - t_1) = \vec{p}_2 - \vec{p}_1$$

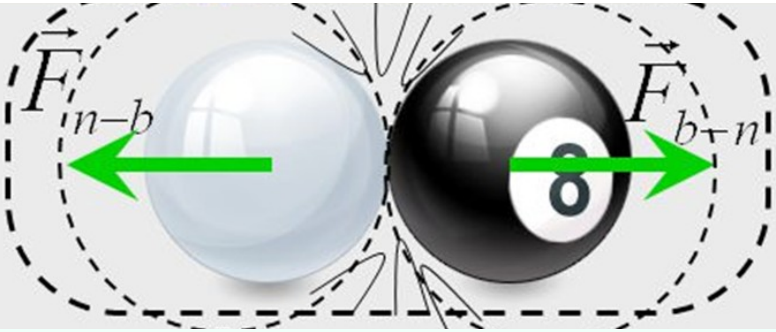
$$\vec{J} = \vec{p}_2 - \vec{p}_1 \qquad \text{(teorema del impulso y el momento lineal)}$$



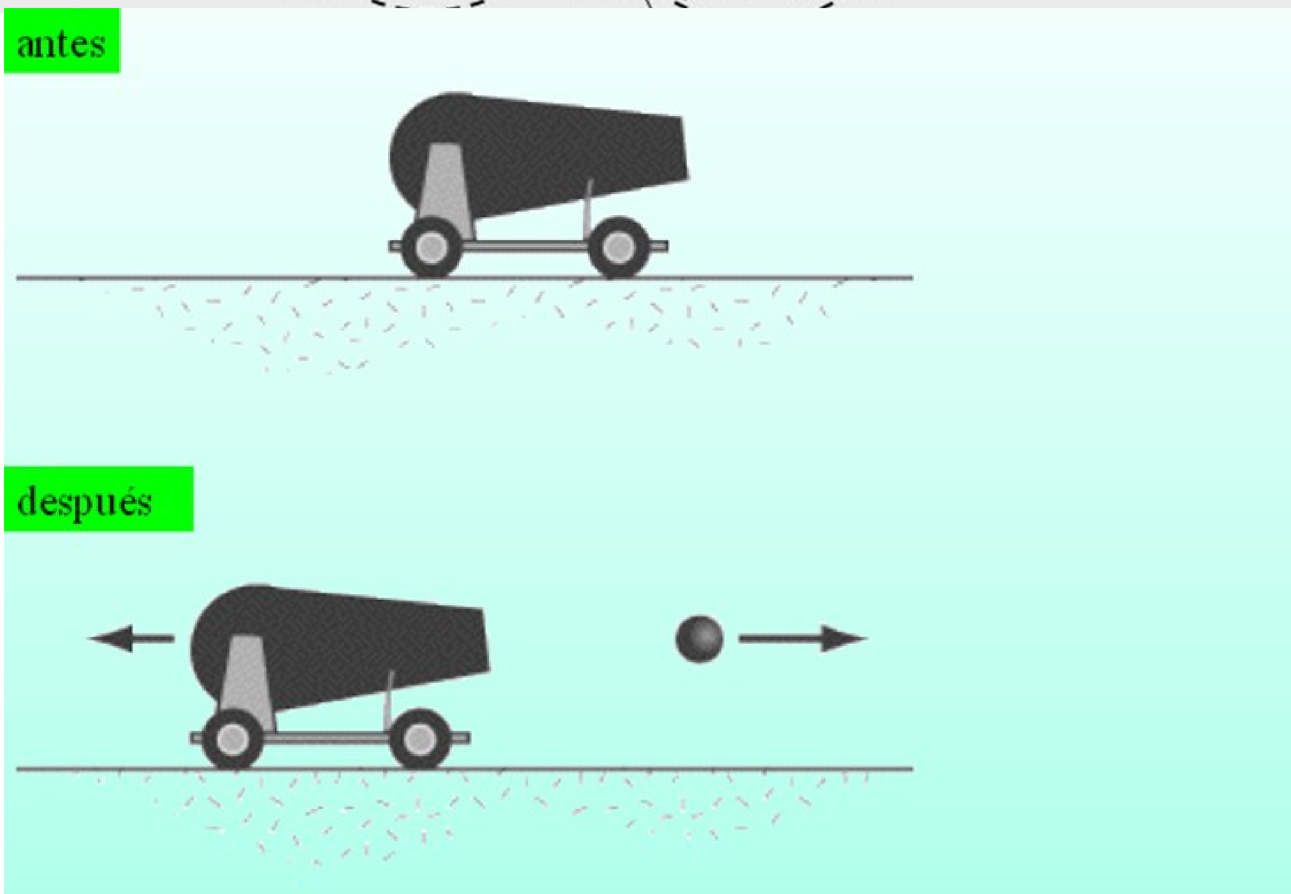



Conservación del momento lineal

$$\vec{F}_{n-b} = \frac{d\vec{p}_b}{dt}$$

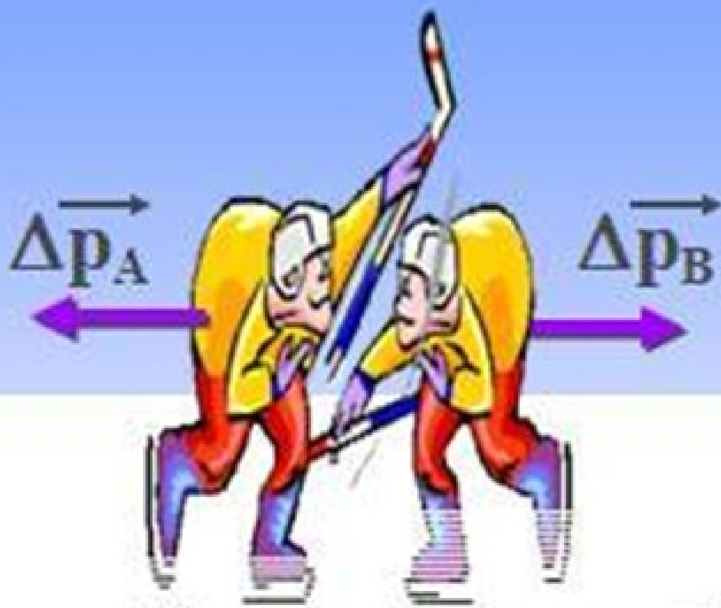


$$\vec{F}_{b-n} = \frac{d\vec{p}_n}{dt}$$



Retroceso: conservación del momento

$$\underbrace{\vec{p}_{A\,(\text{después})} - \vec{p}_{A\,(\text{antes})}}_{\Delta\vec{p}_A} \qquad \underbrace{\vec{p}_{B\,(\text{después})} - \vec{p}_{B\,(\text{antes})}}_{\Delta\vec{p}_B}$$



$$m_A\vec{v}_A - m_A\,\vec{v}_{0A} = -\,(m_B\vec{v}_B - m_B\,\vec{v}_{0B})$$

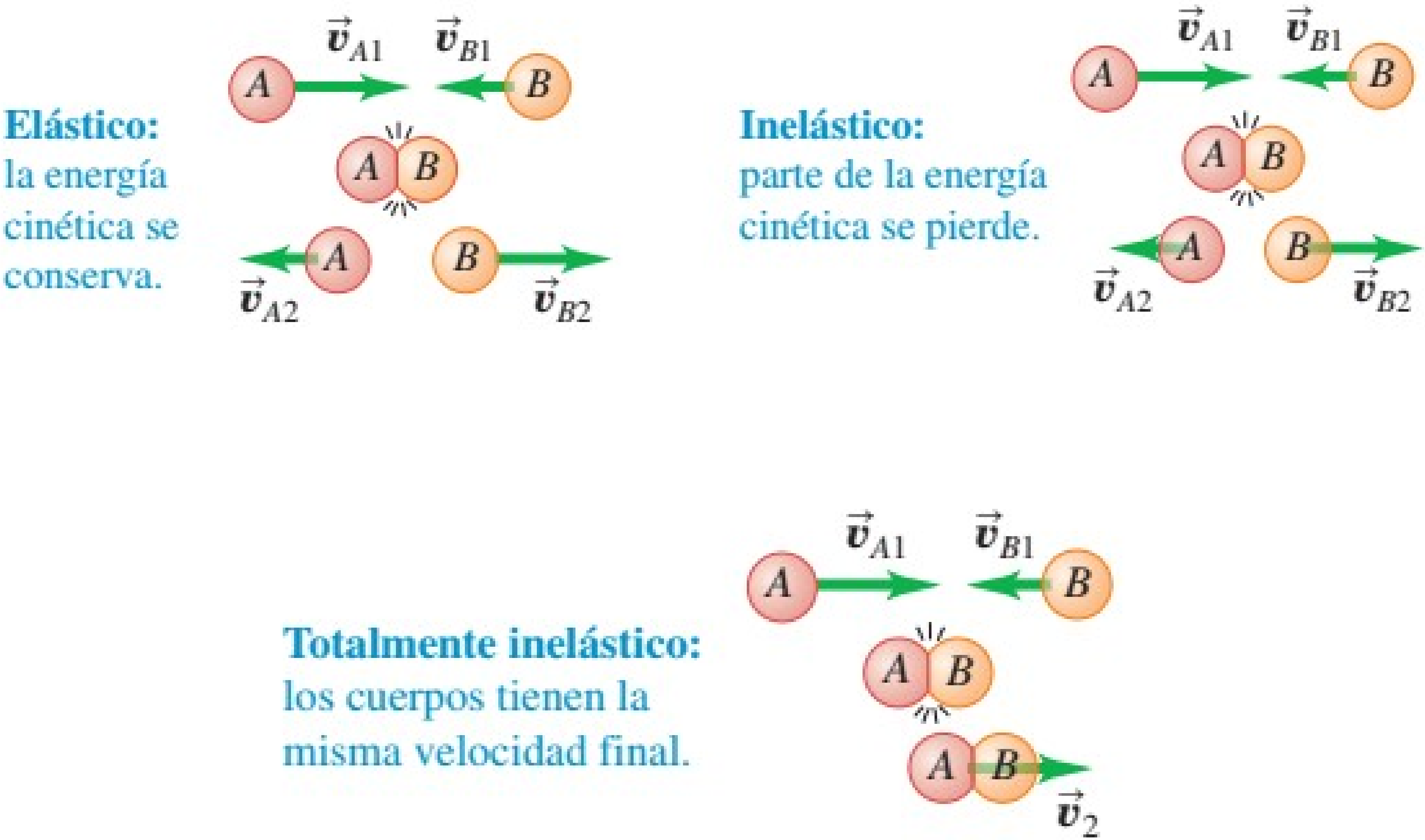
Agrupando $\vec{p}$ total antes y después de la interacción

$$m_A\,\vec{v}_{0A} + m_B\vec{v}_{0B} = m_A\,\vec{v}_A + m_B\,\vec{v}_B$$

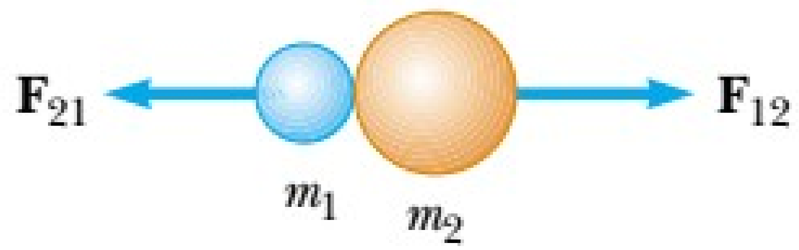
Choques elásticos e inelásticos

Clasificación de los choques

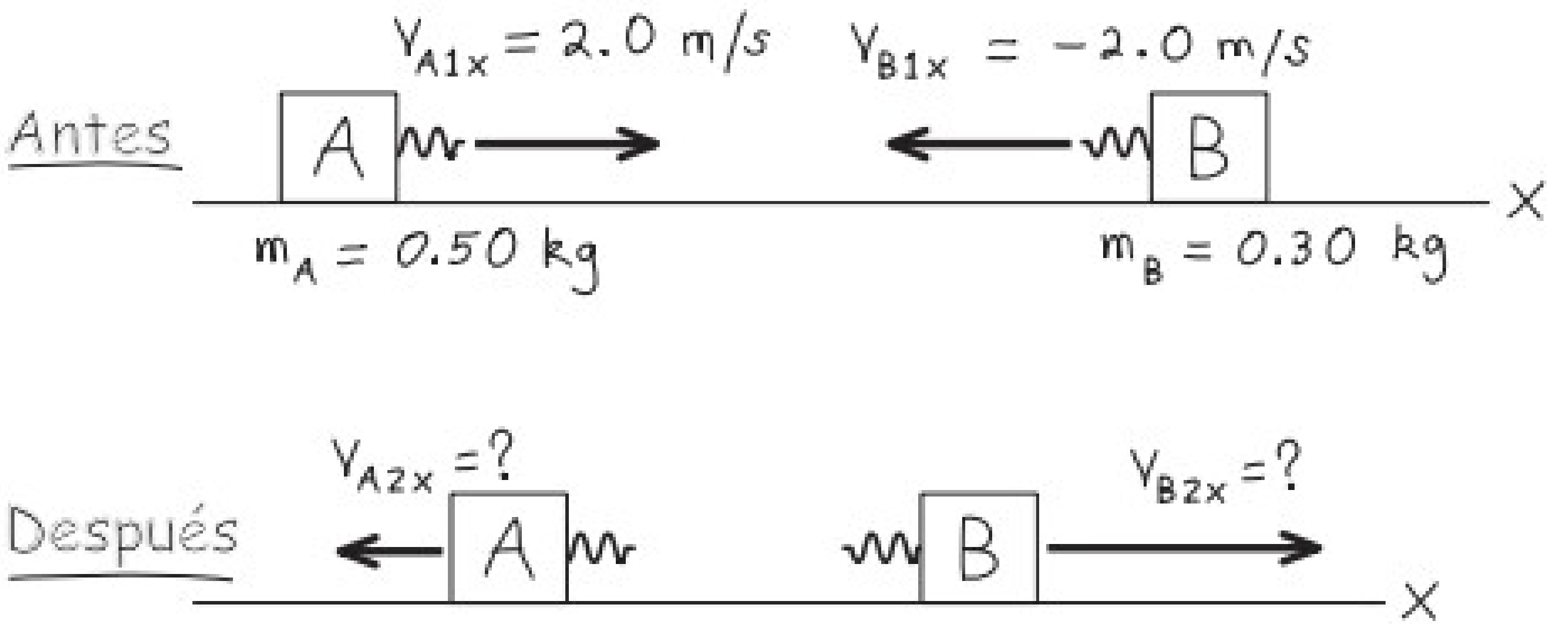
8.20 Los choques se clasifican de acuerdo con consideraciones de energía.



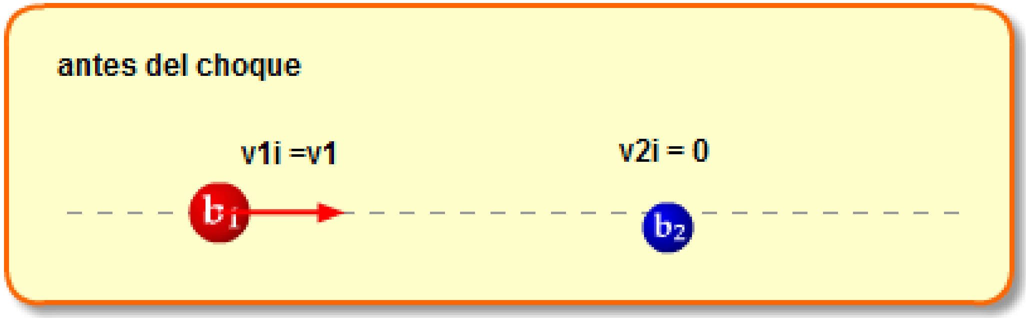
Collisions in One Dimension

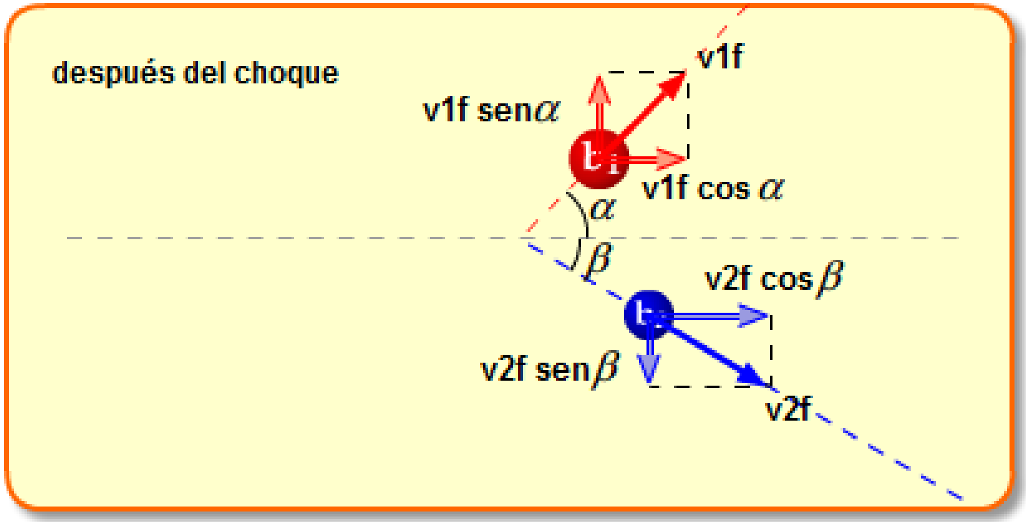


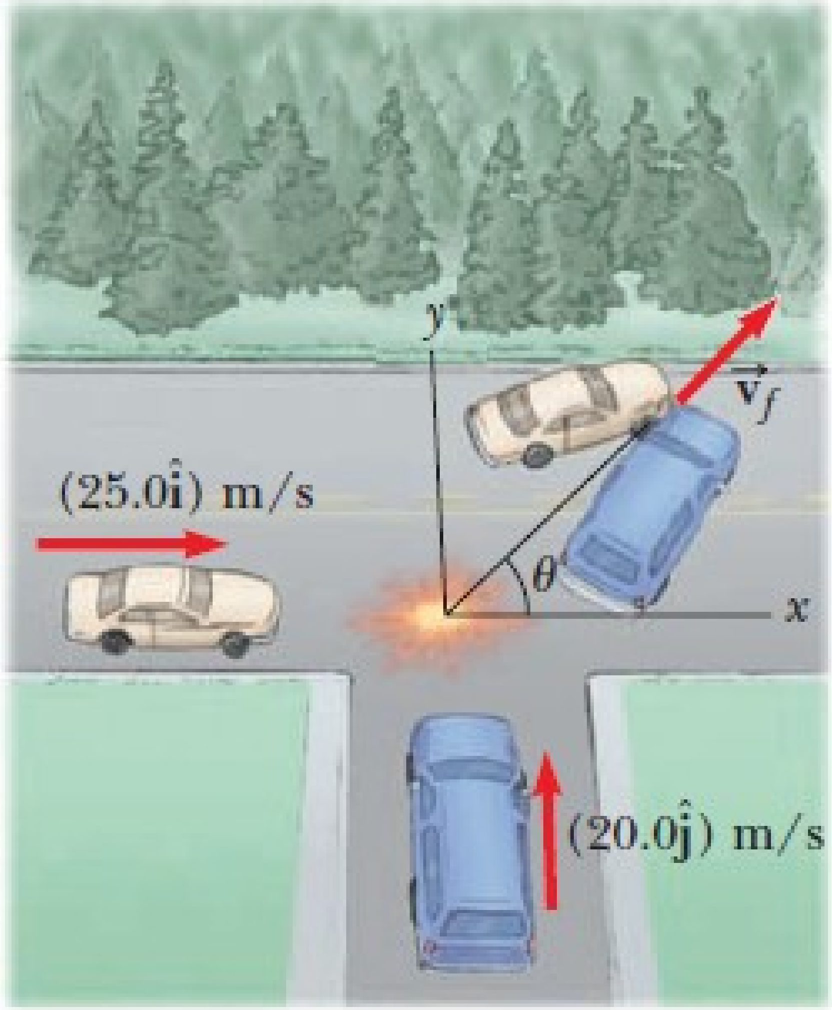
8.24 Bosquejo de esta situación.



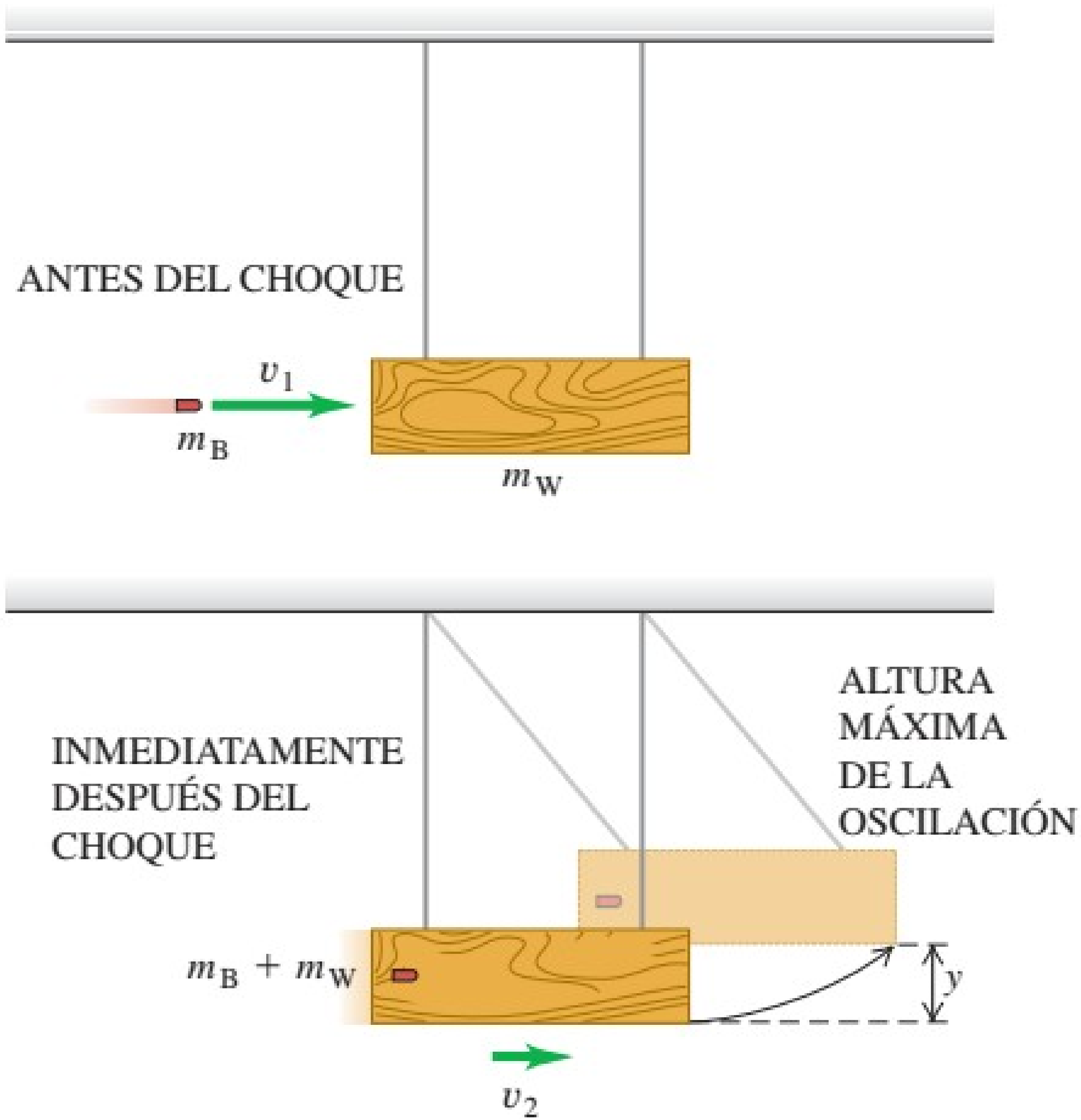
Two-Dimensional Collisions

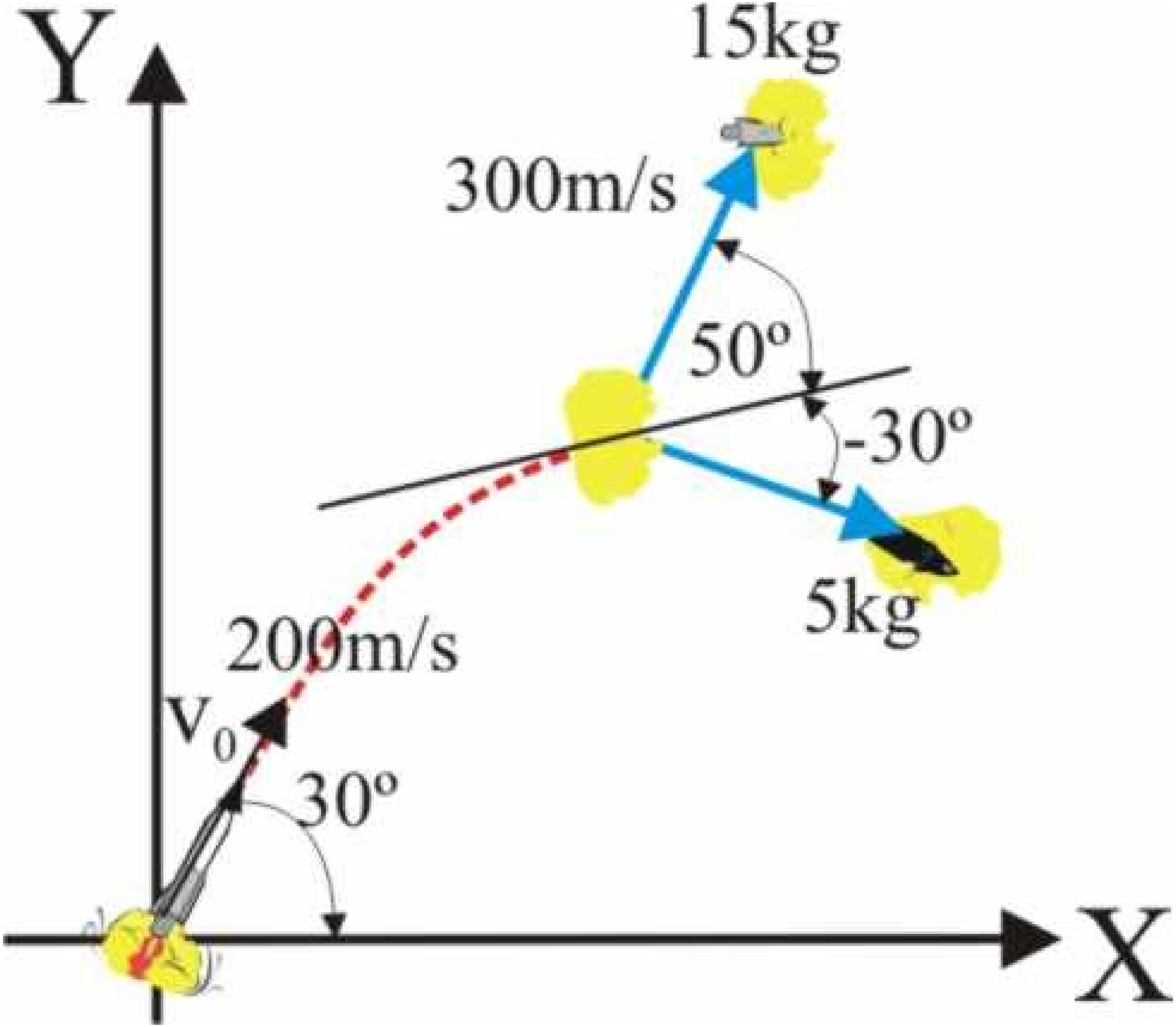


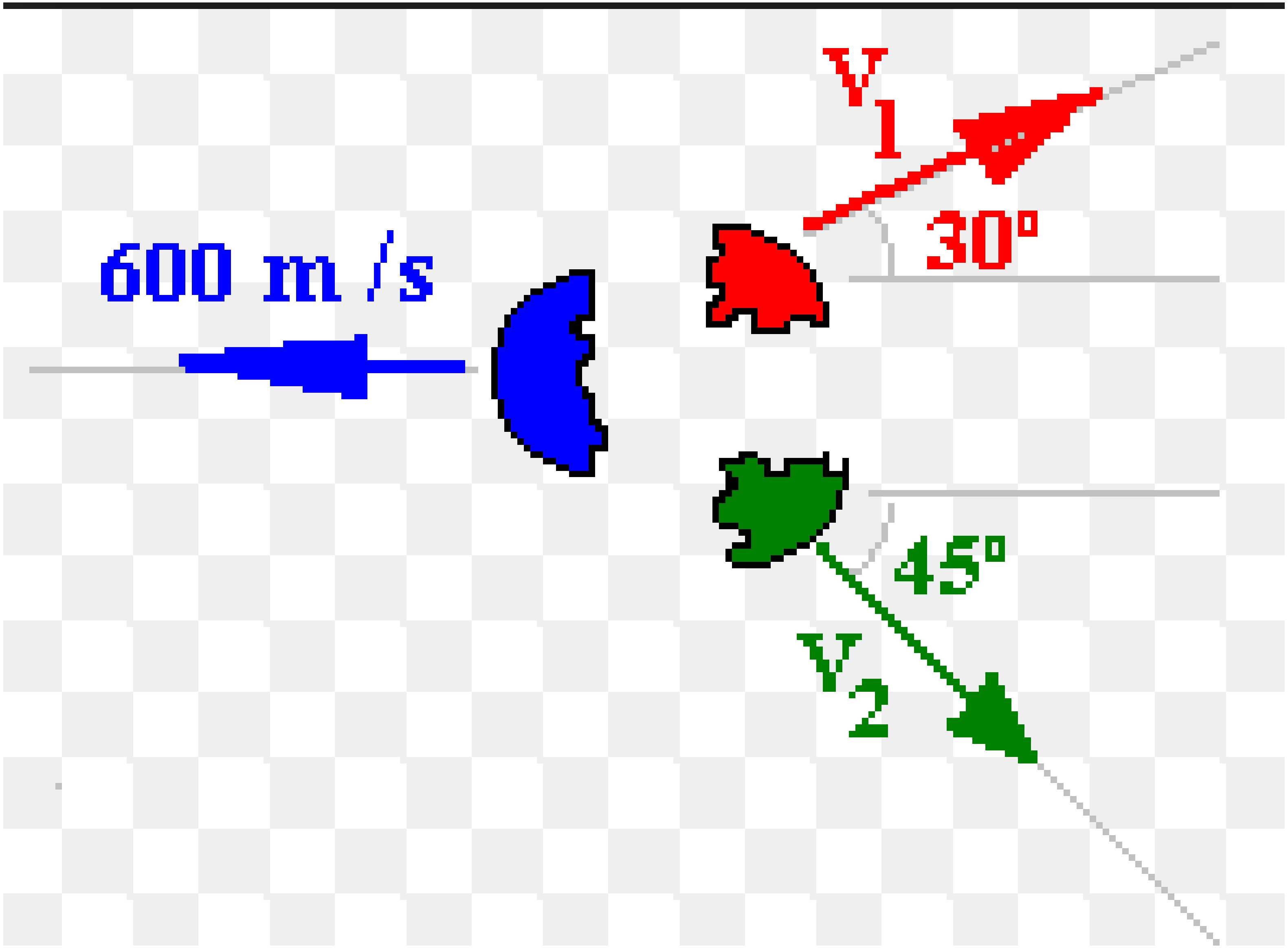




8.18 Un péndulo balístico.




Y
15kg
300m/s
50º
-30º
5kg
200m/s
v_0
30º
X



600 m /s
V
1
30°
45°
V
2