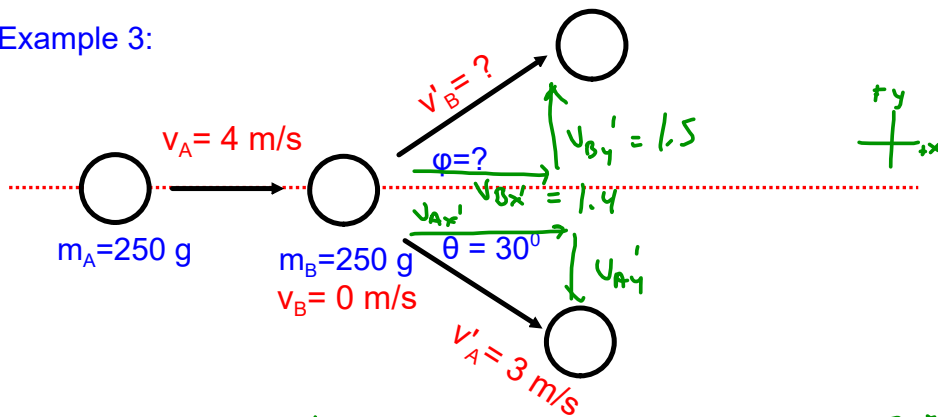


Homework: questions?

Example 3:



$$\Sigma \vec{p}_x = \Sigma \vec{p}_x'$$

$$m_A v_A = m_A v_{Ax}' + m_B v_{Bx}'$$

$$4 \frac{m}{s} = 3 \frac{m}{s} \cos 30^\circ + v_{Bx}'$$

$$4 \frac{m}{s} = 2.6 \frac{m}{s} + v_{Bx}'$$

$$v_{Bx}' = \underline{\underline{1.4 \frac{m}{s}}}$$

$$m_A = m_B$$

$$\Sigma \vec{p}_y = \Sigma \vec{p}_y' = \odot$$

$$\odot = m_B v_{By}' - m_A v_{Ay}'$$

$$v_{By}' = 3 \frac{m}{s} \sin 30^\circ = \underline{\underline{1.5 \frac{m}{s}}}$$

$$c^2 = a^2 + b^2$$

$$v_B'^2 = 1.4^2 + 1.5^2 \quad \tan \phi = \frac{1.5}{1.4}$$

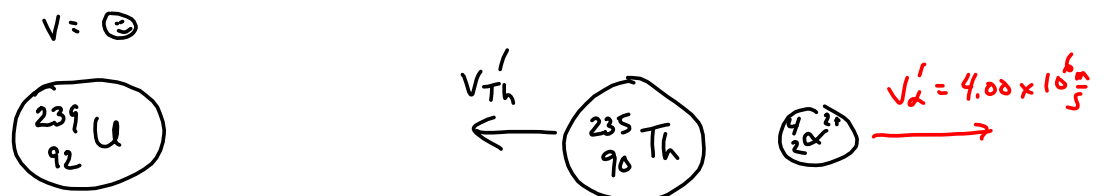
$$v_B = \underline{\underline{2.1 \frac{m}{s}}} \quad \phi = 47^\circ$$

$$\vec{v}_B' = 2.1 \frac{m}{s} \quad 47^\circ \text{ above right}$$

## Explosions

Explosions are characterized by an initial momentum of zero.

Example: A uranium-239 atom kicks out an alpha particle (an He-4 nucleus) at a velocity of  $4.00 \times 10^6$  m/s. What is the recoil velocity of the ??-235 product?



$$\sum \vec{p} = \sum \vec{p}'$$

$$\ominus = m_{\alpha} v_{\alpha}' - M_{Th} v_{Th}'$$

$$\ominus = (4u)(4.00 \times 10^6 \frac{m}{s}) - (235u) v_{Th}'$$

← atomic mass units

$$v_{Th} = 6.8 \times 10^4 \frac{m}{s} \text{ backwards}$$

### Homework:

A plate is dropped on the floor and shatters into three pieces. The first piece ( $m=50\text{ g}$ ) slides to the right across the floor at  $1.5\text{ m/s}$ . The second piece ( $m=150\text{ g}$ ) slides at  $120^\circ$  to the first piece at  $1.0\text{ m/s}$ . The third piece has a mass of  $300\text{ g}$  - what is its velocity?

and Question 1 from sheet.

