2. (15 pts.) A block of mass $m_1 = 0.7\text{kg}$ is moving *to the right* along a frictionless horizontal surface at a speed of 6 m/s. It collides with a second block of mass $m_2 = 2.1\text{kg}$ that was originally moving *to the left* with a speed of 4 m/s. After the collision, block 1 bounces *backward* at a speed of 3 m/s. What is the velocity of the second block after the collision? Call the right positive and the left negative. *Hint*: Watch your signs!

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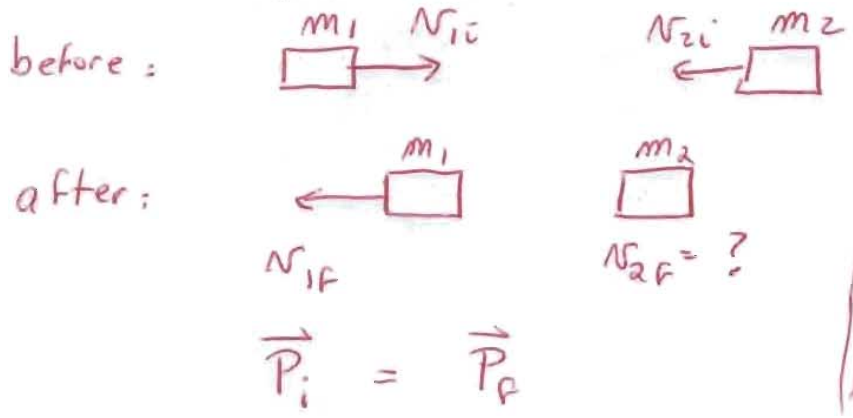

$m_1 = 0.7$
$v_{1i} = 6$
$m_2 = 2.1$
$v_{2i} = -4$
$v_{1F} = -3$
$v_{2F} = ?$

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

$$m_1 v_{1i} + m_2 v_{2i} = m_1 v_{1F} + m_2 v_{2F}$$

$$m_2 v_{2F} = m_1 v_{1i} + m_2 v_{2i} - m_1 v_{1F}$$

$$v_{2F} = \frac{1}{m_2}\left[m_1 v_{1i} + m_2 v_{2i} - m_1 v_{1F}\right]$$

$$= \frac{1}{2.1}\left[(0.7)(6) + (2.1)(-4) - (0.7)(-3)\right]$$

$$\boxed{v_{2F} = -1 \text{ m/s}}$$

Note: Not elastic

$$K_i = \frac{1}{2} m_1 v_{1i}^2 + \frac{1}{2} m_2 v_{2i}^2 = 29.4 \text{ J}$$

$$K_F = \frac{1}{2} m_1 v_{1F}^2 + \frac{1}{2} m_2 v_{2F}^2 = 4.2 \text{ J}$$