

How to solve an inelastic collision question using vector components? Please explain your answer

Solution:

Let's show it in an example:

Absolutely inelastic collision of n objects:

Use the laws of conservation of linear momentum:

$$m_1 \vec{V}_1 + m_2 \vec{V}_2 + \dots + m_n \vec{V}_n = (m_1 + m_2 + \dots + m_n) \vec{V}_{res}$$
$$\vec{V}_{res} = \vec{V}_1 \frac{m_1}{m_1 + m_2 + \dots + m_n} + \vec{V}_2 \frac{m_2}{m_1 + m_2 + \dots + m_n} + \dots + \vec{V}_3 \frac{m_3}{m_1 + m_2 + \dots + m_n}$$

Additive the speeds like a vectors.