

Elastic Collisions

$$m_1 v_{1,i} + m_2 v_{2,i} = m_1 v_{1,f} + m_2 v_{2,f}$$
$$\frac{1}{2} m_1 v_{1,i}^2 + \frac{1}{2} m_2 v_{2,i}^2 = \frac{1}{2} m_1 v_{1,f}^2 + \frac{1}{2} m_2 v_{2,f}^2$$

A 0.015 kg marble moving to the right at 0.225 m/s makes an elastic head-on collision with a 0.03 kg marble moving to the left at 0.18 m/s. After the collision, the smaller marble moves left at 0.315 m/s. What is the velocity of the larger marble after the collision? Verify your answer by calculating the total KE before and after the collision. $m_1 v_{1,i} + m_2 v_{2,i} = m_1 v_{1,f} + m_2 v_{2,f}$

Verify your answer by calculating the total KE before and after the collision.

$$\frac{1}{2}m_1v_{1,i}^2 + \frac{1}{2}m_2v_{2,i}^2 = \frac{1}{2}m_1v_{1,f}^2 + \frac{1}{2}m_2v_{2,f}^2$$