Problem 1:

Suppose a clay model of a koala bear has a mass of 0.200 kg and slides on ice at a speed of 0.750 m/s. It runs into another clay model, which is initially motionless and has a mass of 0.350 kg. Both being soft clay, they naturally stick together. What is their final velocity?

Solution

This is a perfectly inelastic collision, therefore:

\[ m_1v_1 + m_2v_2 = (0.200 \text{ kg})(0.750 \text{ m/s}) + 0 = (0.550 \text{ kg})v_f \]

so \( v_f = 0.272 \text{ m/s} \)