Solution to Question #87899, Physics / Mechanics | Relativity | for completion

A steel ball A of mass 20.0 kg moving with a speed of 2.0 ms−1 collides with another ball B of mass 10.0 kg which is initially at rest. After the collision A moves off with a speed of 1.0 ms−1 at an angle of 30º with its original direction of motion. Determine the final velocity of B.

Solution:

Assume the collision is inelastic

Now apply law of conservation of momentumin x direction

$$m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$$

$$20\times 2+10\times 0 = 20\times 1\times \cos 30^0 +10\times v_2$$

Solve for v_2

v_2=2.268m/s