

(7.01) - Energy in Collisions Worksheet

1. A compressed spring is placed between two carts that are initially at rest on a frictionless, horizontal surface. The spring is released, and the carts move away in opposite directions. Which of the following statements is true regarding this situation?
 - a. Mechanical energy is not conserved since the carts sped up and increased kinetic energy
 - b. Mechanical energy is not conserved because a spring was present.
 - c. Mechanical energy is conserved because the carts moved in opposite directions
 - d. Mechanical energy is conserved because only elastic and kinetic energies are present

2. A 0.5 kg lab cart moves along a frictionless, horizontal track with a velocity of 3 m/s to the East. The cart collides *elastically* with an initially resting 1.0 kg lab cart. The two carts do not stick together, and the 0.5 kg cart is observed to continue East with a velocity of 1.0 m/s after the collision. What is the magnitude of the velocity of the 0.75 kg cart after the collision?

3. A 0.5 kg lab cart moves along a frictionless, horizontal track with a velocity of 2 m/s. The cart collides with an initially resting 0.75 kg lab cart. The two carts stick together and move with a shared velocity of 0.8 m/s.
 - a. Was this an elastic or inelastic collision? How do you know?
 - b. Was there any energy dissipated in this collision? If yes, find the value.