

Pre-Lab Practice: Linear Momentum and Collisions

Review the Textbook:

- *PHYS 1401: Serway & Vuille: Chap 5&6, Example 6.4*
- *PHYS 2425: Serway & Jewett: Chap 7&8, Example 9.5*

Two gliders moving from opposite directions collide on an air-track. The masses of the gliders are 0.30 kg and 0.70kg. Before the collision, the speeds of gliders are 0.30m/s and 0.45m/s, respectively. After the collision, the first glider rebounds with speed 0.40m/s. Assume the first glider is initially moving in a positive direction.

1. What is the momentum of the first glider before the collision?
(0.09 kgm/s)
2. What is the momentum of the second glider before the collision?
(-0.32 kgm/s)
3. What is the total momentum of the system before the collision?
(-0.23 kgm/s)
4. What is the momentum of the first glider after the collision?
(-0.12 kgm/s)
5. Apply the conservation of the linear momentum to calculate the speed of the second glider after the collision.
(0.15 m/s)
6. Did second glider rebound after collision?
(No)
7. What is the kinetic energy of the system before the collision?
(0.084 J)
- 8) What is the kinetic energy of the system after the collision?
(0.032J)
9. Is this an elastic collision? Justify your answer.
(Because this collision results in a loss of kinetic energy by the system, this is not an elastic collision)