

AP Physics: Impulse-Momentum Lab

Purpose

A dynamics cart with spring-loaded plunger extended collides with a force sensor. A cinder block prevents the force sensor from moving, and the cart is propelled in the opposite direction. A motion sensor records $v(t)$ during the collision. The computer plots a force-time graph, and the area under that graph is compared with the change in momentum of the cart.

Report

- A graph of the force of the force sensor on the cart F_s vs. time for the collision, appropriately scaled and formatted.
- Impulse of force sensor on cart shown as area under the curve

On reverse side:

- Authors, title, date

Clearly answer the following questions using AP standards for problem solving:

1. Sketch the system and show the direction of positive x .
2. What is the impulse of the force sensor on cart (magnitude, direction, and units)?
3. What is the change in momentum of cart during the collision (magnitude, direction, and units)?
4. Compute the percent difference between these two and propose an explanation.
5. Suppose the difference is due entirely to friction. Compute the coefficient of friction.