

## Homework Set - Impulse and Momentum

**Readings**

§7.1-7.6pp.187 -207

Vocabulary to be familiar with:

*Impulse**momentum**Conservation of momentum**Internal forces**External forces**Elastic collision**Inelastic collision**Isolated system***Questions & Problems**Questions: 1, 2, 8, 10, 12, 13, 15

## SUPPLEMENTAL QUESTIONS:

- 1.) Explain why the impact force is greater in collisions involving bouncing.
- 2.) A bug hits a windshield of a car head-on, at high speed. Compare the following (2pts):
  - (a) the *forces* on the bug and car
  - (b) the *impulses* on the bug and car
  - (c) the *change in momentum* of the bug and car
  - (d) the *changes in speed* of the bug and car
- 3.) Can a butterfly have the same momentum as an elephant? Explain.

Problems: 3, 5, 13, 17, 20, 25, 37, 41, 49, 54**Extra:** (max of 3pts)Problems: 14, 24, 39, 60

**\*\*Prove algebraically that for any elastic collision between two bodies where one body is at rest, the following two relations hold (2pts):**

$$v_1 = \left( \frac{m_1 - m_2}{m_1 + m_2} \right) v_{01} \quad v_2 = \left( \frac{2m_1}{m_1 + m_2} \right) v_{01}$$

Outlines		10
Questions		12
Problems		13
Extra/Other		
<b>Total</b>		<b>35</b>