

**MOMENTUM**

Book Chapter: 6

Book Pages: 155-174

Practice Problems: pp177-181; 6, 20, 26, 48

Terms/ Ideas:

Momentum

2<sup>nd</sup> Law in terms of momentum

Law of conservation of momentum

Elastic and inelastic collisions (energy conserved or not)

Equations:

$$p = \frac{h}{\lambda}$$

$$p = mv$$

$$ft = mv - mv_0$$

Free Response Question:

A)



Two blocks are resting on a frictionless surface, one block has a mass  $3M$  the other has mass  $M$ . Both blocks are then set into motion. The more massive block is given velocity  $v$  while the smaller block is given velocity  $6v$ .

- 1) What is the total momentum of the above system?
  
  
  
  
  
  
  
  
  
  
- 2) What is the kinetic energy of the smaller block?

3) What is the total energy of the system?

After a time  $t$ , the two blocks collide and stick together without losing any energy.

4) In what direction would the blocks be moving after the collision.

5) What is the total momentum of the system after the collision.

B) A .4 kg ball is at rest on a frictionless horizontal surface. It is hit by a .1 kg ball moving horizontally at 4 m/s. After the collision the .1 kg ball has a velocity of 2 m/s at an angle of  $43^\circ$  to the positive x-axis.

1) Determine the velocity and direction of the .4 kg ball after the collision.

2) Determine the amount of Kinetic Energy lost in the collision.