Honors Physics: Momentum Problems #1 Name:_____

Objectives: P3.5a, P3.3c,P3.4g, P3.3b

Directions: Please show all of your work to receive full credit.

1. A 3000kg cannon rests on a frozen pond. The cannon fires a 30kg cannon ball to the right. If the cannon recoils at 1.8m/s, what is the final velocity of the cannon ball?

_____ m/s

2. A large 1800kg car is stopped at a light. A small 900kg car strikes it from behind. If the small car was traveling 20m/s before impact, what is the velocity of the interlocked cars after the collision?

_____ m/s

3. A 5g bullet is fired into a 1kg block of wood and imbeds in it. The force causes the block to fly 5cm straight up into the air. What is the initial velocity of the bullet?

_____ m/s

4. A 730n man stands 5m from the shore on a frozen pond. In order to reach the shore, the man throws his 1.3kg physics text towards the other shore at 10m/s. How long will it take the man to reach the shore?

_____ s

5. A 2000kg meteorite has a speed of 80m/s before impacting the earth. What is the recoil speed of the earth(M earth= 5.98 e 24kg)

_____ m/s

6. A railroad car of mass 2 e 4kg moves at 5m/s and collides and couples with 3 identical cars moving in the same direction with a speed of 2m/s. Find the speed of the 4 cars. Find the energy lost in the collision.

_____m/s

_____ j lost

7. A 2000kg car going 20m/s overtakes and collides with a 3000kg car going 10m/s in the same direction. The cars collide inelastically. What is the speed of the system? How much energy is lost in the collision?

_____m/s

_____ j lost

8. A 6 g bullet is fired into a 2kg block initially at rest on a table 1m high. The bullet remains in the block after impact which lands 2m from the bottom of the table. Find the initial speed of the bullet.

_____ m/s