Name: Momentum Assignment

1. a) What is the momentum of a 105kg hockey player skating with a speed of 6.1m/s? (1 marks)

b) What impulse do the boards need to impart to stop the hockey player? (1 mark)

c) If the boards stop the hockey player in 0.75s, what average force is exerted on the hockey player? (1 mark)

1. A 4.5 kg cart travelling at 3.1m/s collides with a stationary 2.4kg cart, and the two carts stick together. What is their common velocity after the collision? Include a diagram. (3 marks)
2. A 1.2 x 103kg railway car is coasting at 8.5m/s when suddenly 3.2 x102kg is dropped into it. What is its new velocity? Include a diagram (3 marks)
3. A 1275kg car travelling 25m/s East collides head on with a 1500kg truck travelling 20.m/s West. If the vehicles stick together, what is their velocity? Include a diagram (3 marks)
4. What impulse must be imparted to a 120.0g baseball to change its velocity from 45.0m/s south to
   1. 55.0m/s north? (2 marks)
   2. If the collision between the baseball and the bat lasted 1.00x10-3s, what force did the bat exert on the baseball? (2 marks)
5. A 950kg car moving south at 23.2m/s collides with a 1200kg car moving east at 14.3m/s. The two cars are stuck together. In what direction and at what speed do they move after the collision? (5 marks)

Extra: A 1300kg car moving west at 16.2m/s is struck by a 1975kg car moving north. They are stuck together and move with a final velocity of 16m/s at 64.00 [N of W]. Was the north moving car exceeding the 21m/s speed limit? (5 marks)