Physics 151 Class Exercise: Momentum

1.   (a) A 0.20-kg model railroad car moving with a speed of 0.24 m/s is struck from behind by an 0.42-kg model locomotive moving along the same line with a speed of 0.52 m/s. If they stick together after the collision, what is their velocity? (Make sure your draw a picture of the situation and indicate your coordinate system.

Answer:	

(b) Redo the above problem assuming that train 2 is traveling in the opposite direction as train 1 and there is a head-on collision (they still stick together).

Answer:	

2. To make a bounce pass, a player throws a 0.60-kg basketball toward the floor. The ball hits the floor with a speed of 5.4 m/s at an angle of 65° to the vertical.

(a) If the ball rebounds with the same speed and angle, what was the impulse delivered to it by the floor? (Hint: Think of the velocity of the ball in terms of components that are parallel and perpendicular to the floor.)

Answer:	

(b) If the ball was in contact with the floor for 38 ms, what was the average force exerted by the floor during that time.

Answer:	