Third Law Problems

1. A paintball with a mass of 0.15 kg is fired from a paintball gun that has a mass of 5.5 kg. The paintball leaves the gun with a velocity of 45 m/s [N] having accelerated for 0.10 s. Calculate the acceleration and the final velocity of the paintball gun.

2. A diver with a weight of 833 N dives from a boat with a mass of 375 kg. If he leaves the boat with a velocity of 2.25 m/s [W] after accelerating for 0.50 s, what will be the final velocity of the boat?

3. A car having a mass of 999 kg is travelling with a velocity of 26 m/s [N]. It then changes its velocity to 28 m/s [N]. If this change took 2.5 s, find the unbalanced force needed to cause this acceleration.

4. Two hockey players standing stationary on the ice facing one another. Player A has a mass of 85 kg and Player B is 110 kg. They shove each other and Player A ends up with a velocity of 1.5 m/s [W]. Find the final velocity of Player B.