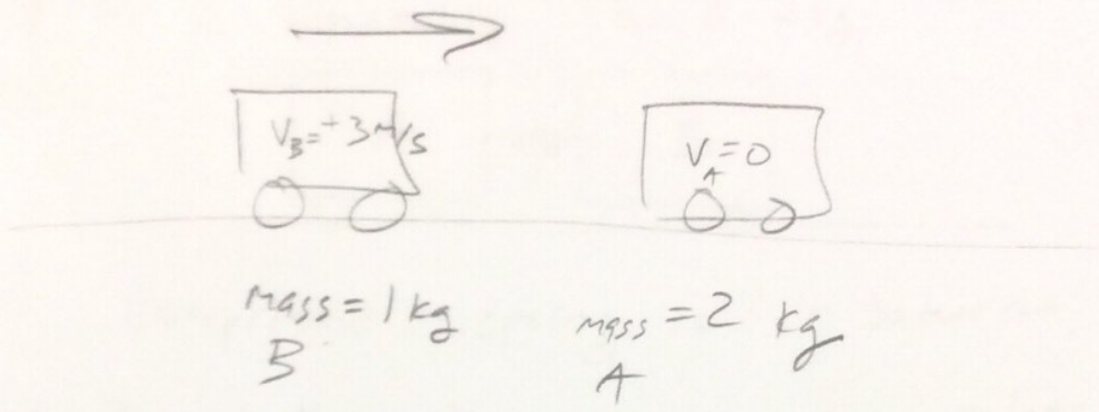


Inelastic Collision

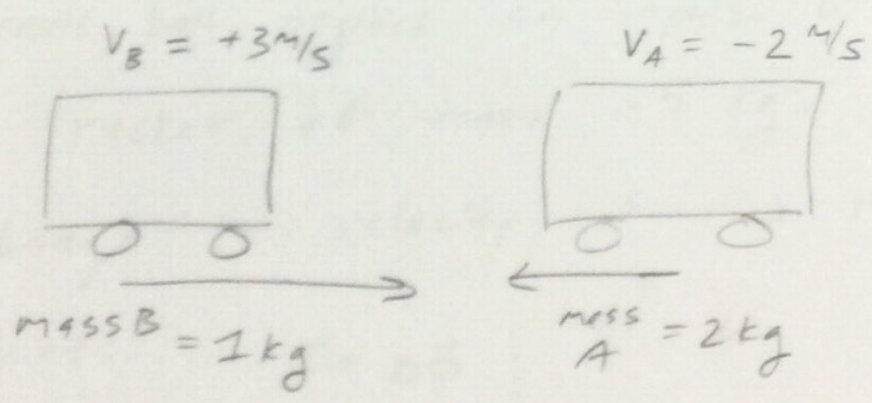
1.



How fast will the combined carts travel after the collision?

2.

Elastic Collision



After the two carts collide $V_B' = -1 \text{ m/s}$.

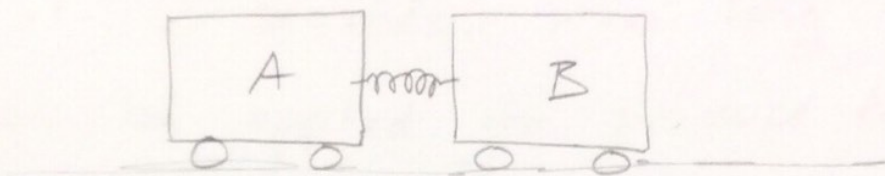
What is the velocity of cart A after the collision?

3.)

The carts begin at rest.

mass A = 1 kg

mass B = 2 kg



A compressed spring is in between carts A & B before the carts are released. The velocity of A is -5 m/s after being released, what is the final velocity of B?

4.) A tennis ball applies an impulse of $30 \text{ N}\cdot\text{s}$ to a racket of mass 1.5 kg . What is the change in velocity of the racket.

hint:

$$J = \Delta \vec{p}$$

$$F \cdot t = m(\Delta v)$$

5.) A 3 N force is applied to a cart for a period of 60 seconds. How long must a 9 N force be applied to produce the same change in momentum?

$$J = \Delta \vec{p}$$

$$J_1 = J_2$$

$$F_1 \cdot t_1 = F_2 \cdot t_2$$

6.) A 30 N force acts on a ball for 3 seconds. The ball has mass 2 kg. What is the ball's change in momentum?

$$J = \Delta \vec{p}$$

$$F \cdot t = m(\Delta v)$$

7.) Egg 'A' is dropped from a height of 5 meters and lands on concrete. Another identical egg 'B' is dropped from a height of 5 meters and lands on a soft mattress.

a.) Which egg experienced a greater change in momentum?
Egg A Egg B The same.

b.) Which egg experienced a greater impulse?
Egg A Egg B The same

8.) What happens to an object's momentum if its speed triples?

9.) A baseball traveling 40 m/s is caught and comes to rest in a player's over a $.2$ seconds time interval. What was the average net force on the ball by the glove? Ball Mass = $.13 \text{ kg}$

$$F \cdot t = m (v_f - v_i)$$

10.) What is the momentum of an object traveling at 10 m/s with mass 6 kg ?

11.) Which units are acceptable for impulse?

m/s/s $\frac{\text{kg} \cdot \text{m}}{\text{s}}$ Ns kgm^2 m/s

12.) Two cars with different masses are traveling the same speeds. Within the same interval which car requires more force to stop?

