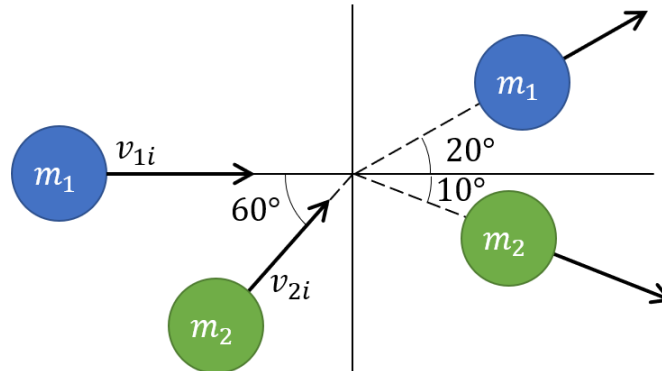


ENGR/PHYS 216 – Spring 2023
HW Assignment 8: Collisions

1. Two large balls roll over a smooth surface and collide. They are made of a super hard material so there is no deformation. Ball 1 has a mass m_1 of 4.00 kg and travels with an initial velocity of 2.55 m/s . Ball 2 has a mass m_2 of 2.61 kg and travels with an initial velocity of 1.55 m/s . A diagram of their collision is shown below. After the collision, what is the velocity of (a) ball 1 and (b) ball 2?



2. A villain with mass 84.0 kg runs at a velocity of 9.26 m/s directly into Chuck Norris' fist moving at a speed of 0.150 m/s . The villain is knocked back at a velocity of 8.52 m/s and angle 20.0° from the horizontal, while Chuck Norris' fist moves at a velocity of 0.0745 m/s and 10.0° from the horizontal.

- a. What is the mass of Chuck Norris' fist in kg ?
- b. How much kinetic energy is lost in the collision?



Note: This is a silly problem with silly answers!

3. Ender and Shen are flying at each other during a battle in space. Ender moves with a velocity v_1 of 9.660 m/s while Shen, with a mass of 53.8 kg , moves at a velocity v_2 of 7.26 m/s . When the two collide, they hold on to each other and move with a velocity v_3 of 5.164 m/s . What is Ender's mass, in kg ?

