

In Class Conservation of Momentum Examples – Mar 29, 2009

1. A 2,000-kilogram railroad car moving at 5 m/sec collides with a 6,000 kilogram railroad car at rest. If the cars coupled together, what is their velocity after this inelastic collision?

2. You are given the following data about a golf club hitting a stationary golf ball with which you will calculate the speed of the golf ball after it is hit by the golf club
 - a. mass of club head = 0.350 kg
 - b. mass of golf ball = 0.046 kg
 - c. speed of club head before collision = 38 m/s
 - d. speed of club head after collision = 29 m/s

3. Identical twins Kate and Karen are rowing their boat on a hot summer afternoon when they decide to go for a swim. Kate, whose mass is 45 kilograms, jumps off the front of the boat at a speed of 3.00 m/sec. Karen jumps off the back at a speed of 4.00 m/sec. If the 70-kilogram rowboat is moving at 1.00m/s when the girls jump, what is the speed of the rowboat after the girls jump?

4. A 0.10-kilogram piece of modeling clay is tossed at a motionless 0.10-kilogram block of wood and sticks. The block slides across a frictionless table at 15 m/sec.
 - a. At what speed was the clay tossed?
 - b. The clay is replaced with a “bouncy” ball tossed with the same speed. The bouncy ball rebounds from the wooden block at a speed of 10 meters per second. What effect does this have on the wooden block? Why?