

Physics 111 Session 12

- 1) Determine whether the following are elastic or inelastic collisions:
 - a) 2 cars crash and stick together
 - b) You throw a ball off the wall and it bounces back with the same speed
 - c) A tennis player hits a tennis ball with a racquet

- 2) Find the momentum of a 1000 kg car going 50 km/h. If a 250 kg motorcycle has the same momentum, how fast is the motorcycle going?

- 3) Find the change in momentum of a 0.5 kg ball going 10 m/s that bounces off a wall and travels 5 m/s after the collision.

- 4) Find the average force that the wall exerted on the ball in question 3 if the collision lasted 0.2 seconds.

- 5) A 500-kg motorcycle is going 20 m/s down the highway. How long would a 1000-N force take to speed up the motorcycle to 40 m/s?

- 6) Two objects collide and stick together in an inelastic collision on a frictionless surface. The first has a mass of 14 kg and a velocity of +15 m/s. The second has mass of 20 kg and a velocity of -10 m/s. Find the final velocity of the two

- 7) A 1200 kg car going north at 10 m/s and a 1000 kg car going west at 12 m/s collide at an intersection in an inelastic collision. Find the velocity of the two cars after the crash.

- 8) Two hockey pucks with mass 0.15 kg collide on a track. Initially, they are going +6 m/s and -8 m/s. If, after the collision, one of the pucks is going +4 m/s, how fast is the other one going?

CHALLENGE:

My brother and I are ice skating. I'm at rest and he crashes into me going 8 m/s. If I weigh 100 kg and he weighs 80 kg, find our final velocities if the collision is inelastic.