Introduction:

What is true about Kinetic energy in an elastic collision? An inelastic collision?

1. Two balls with equal masses, m, and equal speed, v, engage in a head on elastic collision. What is the final velocity of each ball, in terms of m and v?

2. Two balls, each with mass 2 kg, and velocities of 2 m/s and 3 m/s collide head on. Their final velocities are 2 m/s and 1 m/s, respectively. Is this collision elastic or inelastic?

3. A car of 500 kg, traveling at 30 m/s rear ends another car of 600 kg, traveling at 20 m/s. in the same direction the collision is great enough that the two cars stick together after they collide. What kind of collision is this? How fast will both cars be going after the collision?

4. A bullet of mass 0.04kg is shot into a station box that moves at a constant velocity once the bullet is logged into its side. The bullet is initial moving at 900m/s and the block weighs 7kg. Find the change in kinetic energy.
5. Find the center of mass of an object modeled as two separate masses on the x-axis.

![Diagram of two masses on the x-axis: 2 kg at x=2 and 6 kg at x=8.]

6. Find the location of $Y_o$ of the center of mass of this shape below.

![Diagram of a shape with a horizontal axis and vertical axis labeled Y and X.]

7. To weigh a fish, a fisherman places a fish on a perfectly horizontal pole. One end has a 5kg cooler and the other end has a 3.5kg tackle box. The pole is held up by the rope that is directly in the middle of the pole. If the fish is halfway between the tackle box and rope, what is the mass of the fish?