

Prelab for Lab M16 – Elastic and Inelastic Collisions
PH305 11/18/02

A red glider with mass M and a blue glider with mass $1.5 M$ are on a frictionless air track. The blue glider is initially at rest. The red glider is initially moving towards the blue glider at a speed $V_{i, \text{red}}$. Express your answers to the following questions in terms of the given variables M and $V_{i, \text{red}}$. Circle your answer to each part so it is easy to recognize.

A. If the collision between the two gliders is completely *inelastic*, (in other words if the gliders stick together after they collide), determine:

1. the velocities of the gliders after the collision (use conservation of momentum)

2. the total kinetic energy of the gliders after the collision (use your results from #1)

3. the fraction $KE_{f, \text{total}} / KE_{i, \text{total}}$. (use your results from #2)

B. If the collision between the two gliders is completely *elastic*, (in other words if the collision is perfectly bouncy so that all kinetic energy before the collision remains as kinetic energy after the collision), determine:

4. the velocities of the gliders after the collision (use the method of relative velocities that we learned to do this)

5. the total kinetic energy of the gliders after the collision (use your results of #4 to explicitly calculate this)

6. the fraction $KE_{f, \text{total}} / KE_{i, \text{total}}$. (use your results from #5)

