

HW #8  
Due 4/18/00

1. For elastic collisions where both momentum and energy are conserved in the interaction. Show that
  - a) The center of mass velocity is unchanged in the interaction,
  - b) The magnitude of the relative velocity is unchanged.
  
2. Use the center of mass transform to find the relation between the velocities before and after the collision for the incident particles.
  
3. For the collision between a collection of high velocity incident particles and a Maxwellian background particles ( $|\vec{v}_i| \gg |\vec{v}_b|$ ) Find the Rosenbluth potential function keeping the expansion to  $v_b^2$  term.
  
4. Consider the Boltzmann equation with the simple Krook model. If there is no external force and no spatial gradients, find the distribution at long time limit  $t \gg 1/\nu$