Mekaniikan perusteet (FYSP102), 18.3.2013

Harj 1.

1. a) Distance between atoms in a Kaliumbromidie molecule (KBr)is 0.280 nm. Find out where is the center of mass for this molecule.
   b) In reality atoms are not in the rest; they oscillate. If the velocity of K atom is 5.0×10^3 m/s (relative to CM), then calculate the velocity of Br (relative to CM)?

2. Find out the positioin of the center of mass for a thin half circle plate that has radius R (density of plate is constant).

3. Calculate the moment of the inertia I for a thin uniform rod, length L and mass M when it rotates about the pivot in the center of the rod and the rotation axis is orthogonal to the rod.

4. Calculate moment of inertia for a uniform ball (radius R) when the pivot point is the center of the ball.

5. Lets assume a massless bar, length L, and two point like masses m at the ends. Pivot point is the center of the rod. Investigate how the moment of inertia changes if masses double. How much the length of the rod has to decrease that the moment of inertia returns back to original value