

Physics 220 Assignment 3
Due Thursday 2/5/09

To hand in:

1. TZD 5.6
2. TZD 5.10 (in part a, eliminate r)
3. TZD 5.13
4. TZD 5.14
5. An isolated hydrogen atom initially at rest emits a photon in a transition from the $n=10$ state to the first excited state ($n=2$). Use eV and eV/c units for the following.
 - a) What is the energy of the photon?
 - b) What is the momentum of the photon?
 - c) What is the momentum of the recoiling hydrogen atom?
 - d) What is the kinetic energy of the recoiling hydrogen atom (hint: is the hydrogen atom relativistic in this case)? Is this significant in comparison to the energy of the photon?
6. TZD 5.16
7. TZD 5.24
8. TZD 5.26