Astronomy 401

Stars

Homework # 1, Due Thursday, September 13, 2001

Name: ____________________________

Student number: ________________________

1. Determine the approximate central temperature of the Sun using the equations of stellar structure. Make the approximations necessary to to obtain an analytic solution.
2. Carroll & Ostlie: problem 10.3
3. Calculate the pressure exerted by a gas of degenerate neutrons in terms of their density. Remember that for a degenerate gas their momentum is given by the Uncertainty relation as
$$p = \hbar/\lambda$$
4. Derive a set of linearized equations that can be used to solve for the number density of HI, HII, HeI, HeII, HeIII atoms and electrons as a function of temperature and total density ρ for a mixture of hydrogen and helium when both can be ionized.