Problem 1. Molecular hydrogen gas is kept in a vessel of constant volume. Initially, its temperature and pressure were $T_0$ and $P_0$, respectively. Once the temperature has been increased to $3T_0$, all $H_2$ molecules dissociated into hydrogen atoms. What is the pressure of such atomic hydrogen gas? [10 points].

Problem 2. One mole of ideal monoatomic gas performs a cycle shown in the picture, with $AB$, $BC$ and $CA$ being isothermal, isochoric and adiabatic processes, respectively. Assuming that $T_A$, $V_A$ and $V_B$ are known, find work performed during one cycle. [20 points].

Problem 3. Extra credit, do it only if you have time left after the first two!

One mole of ideal gas performs a process such that $PV^3 = const$. Find specific heat for such process [15 points].

*Hint:* Specific heat is always determined by Eq. (3-28) of the textbook.