CMSC 652 HW 2: HW

1. (50 points) Show that $CNF\text{-}SAT \leq 3\text{-}SAT$. (You may use sources but let me know what they are and hand in your own work.)

2. (50 points) In the proof of the Cook-Levin Theorem what is the part of the formula that corresponds to the instruction $\delta(p, a) = (q, b)$ (If the machine is in state p and there is looking at an a then it overwrites the a with a b.

3. (0 points for now but this will be on the next HW which will be an oral HW. So you can get a headstart.) Prove that Hamiltonian Cycle is NP-complete. Do this by showing 3-SAT $\leq$ HAMCYCLE. There are proofs of this on the Web- just Google "Hamiltonian Cycle is NP-complete" and you'll fine some (I found some great slides by Carl Kingsford who used to be hear but is now at CMU.)