Tutorial 5

1) One mole of copper at a uniform temperature of 273.15K is placed in thermal contact with a second mole of copper which, initially, is at a uniform temperature of 373.15 K. Calculate the temperature of the 2 mole system, which is contained in an adiabatic enclosure, when thermal equilibrium is attained. Is the temperature equal to 323.15 K? What is the entropy change in the system? Surrounding?
Given Cp of copper as $22.64 + 6.28 \times 10^{-3}$ T J mol-1 K^{-1}

2) Calculate the enthalpy and entropy of formation for C_3H_6 at 225°C. Given the formation enthalpy of C_3H_6 at 25°C is 20.3 kJ/mol and further

$C_{P\ C3H6} = 59.58 + 0.1771T$ [J/molK]

$C_{P\ H2} = 28.84$ [J/molK]

$C_{P\ C} = 11.18$ [J/molK]

ΔS at 298 is -267.5 J mol K-1

For an isothermal and isobaric process to produce 1 mole of C3H8 at 225oC, calculate the entropy change to the system? Entropy change to the surroundings? Entropy change to the system and surroundings together? Comment on the feasibility.