Physics I

Laws of Thermodynamics

Problem 1.- The first law of thermodynamics is sometimes whimsically stated as, "You cannot win" and the second law as, "You can't even break even". Explain how these statements could be equivalent to the formal statements.

Problem 2.- State the zeroth law of thermodynamics.

Problem 3.- State the third law of thermodynamics.

Problem 4.- One mole of a monoatomic ideal gas expands adiabatically (Q=0) doing 5,000 J of work in the process. Calculate the change in temperature. *Suggestion*: Use the first law of thermodynamics to find ΔU and then use the heat capacity to find the change in temperature.

Problem 5.- Regarding the "zeroth law of thermodynamics", why is a good emitter of radiation called a black body?