1 Ideal gas calculations

Consider one mole of an ideal monatomic gas at 300K and 1 atm. First, let the gas expand isothermally and reversibly to twice the initial volume; second, let this be followed by an isentropic expansion from twice to four times the original volume.

(a) How much heat (in joules) is added to the gas in each of these two processes?

(b) What is the temperature at the end of the second process?

(c) Suppose the first process is replaced by an irreversible expansion into a vacuum, to a total volume twice the initial volume. What is the increase of entropy in the irreversible expansion, in J/K?