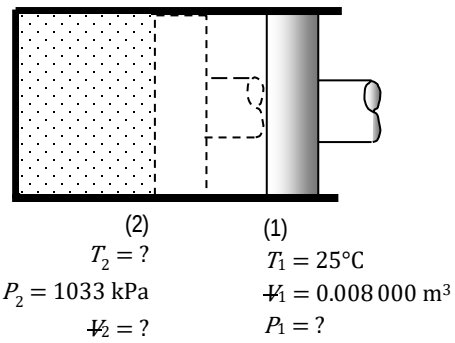
HOMEWORK PROBLEMS: Lesson 2

2-1 A mass of m=0.0948 kg of air is compressed from an initial state of T_1=25°C and $\forbidden{V}_1$=0.008 m^3 to a final state of P_2=1033 kPa in a process for which $P\forbidden{V}^{1.2}$ = constant. **Assuming is an ideal gas with constant specific heats**, find the following quantities

- the initial pressure, P_1,
- the final volume, $\forbidden{V}_2$,
- the work into the air $W_{in,12}$,
- the heat transfer into the air $Q_{in,12}$, and
- the change in entropy of the air S_2-S_1.



Use $c_{p,\,air}$ = 1.005 kJ/kg-K and R_{air} = 0.287 kJ/kg-K.

2-2 Air is compressed in a piston-cylinder device from 100 kPa and 17°C to 800 kPa in a reversible, adiabatic process. **Assuming is an ideal gas with constant specific heats**, determine the final temperature and the work done in kJ/kg. Use $c_{p,\,air}$ = 1.005 kJ/kg-K and R_{air} = 0.287 kJ/kg-K.