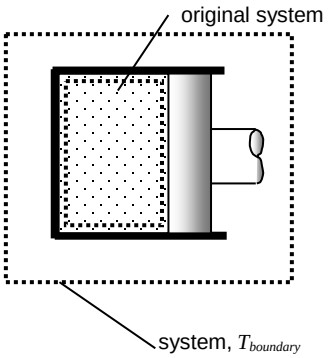
EXAMPLE: And now, entropy!

Reconsider the piston-cylinder from the last example. The device contains 1.5 kg of air. Initially, the air is at 150 kPa and 20°C. The air is compressed in an *isobaric process* until the volume is 1 m^3. Assuming the compression to be quasistatic, you already found



(a) the work into the system, in kJ, and
(b) the heat transfer into the system, in kJ.

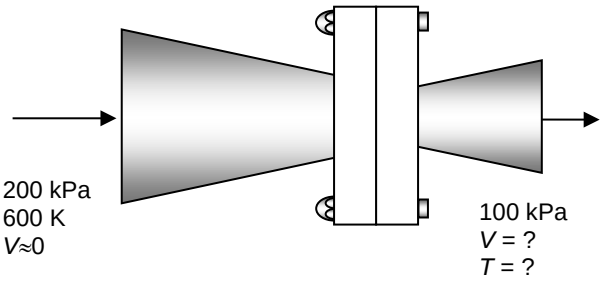
Now for something new!

(c) Find the entropy generation for the following systems:
   (1) the system shown for $T_{boundary}$ = 400 K
   (2) the system shown for $T_{boundary}$ = 300 K, and
   (3) your original system.

EXAMPLE: What's *isentropic efficiency*, I wonder?

Air flows steadily through a supersonic nozzle. The entering air has negligible velocity. If the process is **reversible and adiabatic,** (Everybody sing! That means it's also _____!)

(a) find the exit air temperature, and
(b) the exit velocity.
(c) What do you think the *isentropic efficiency* of this nozzle is?[1]



[1] 4