

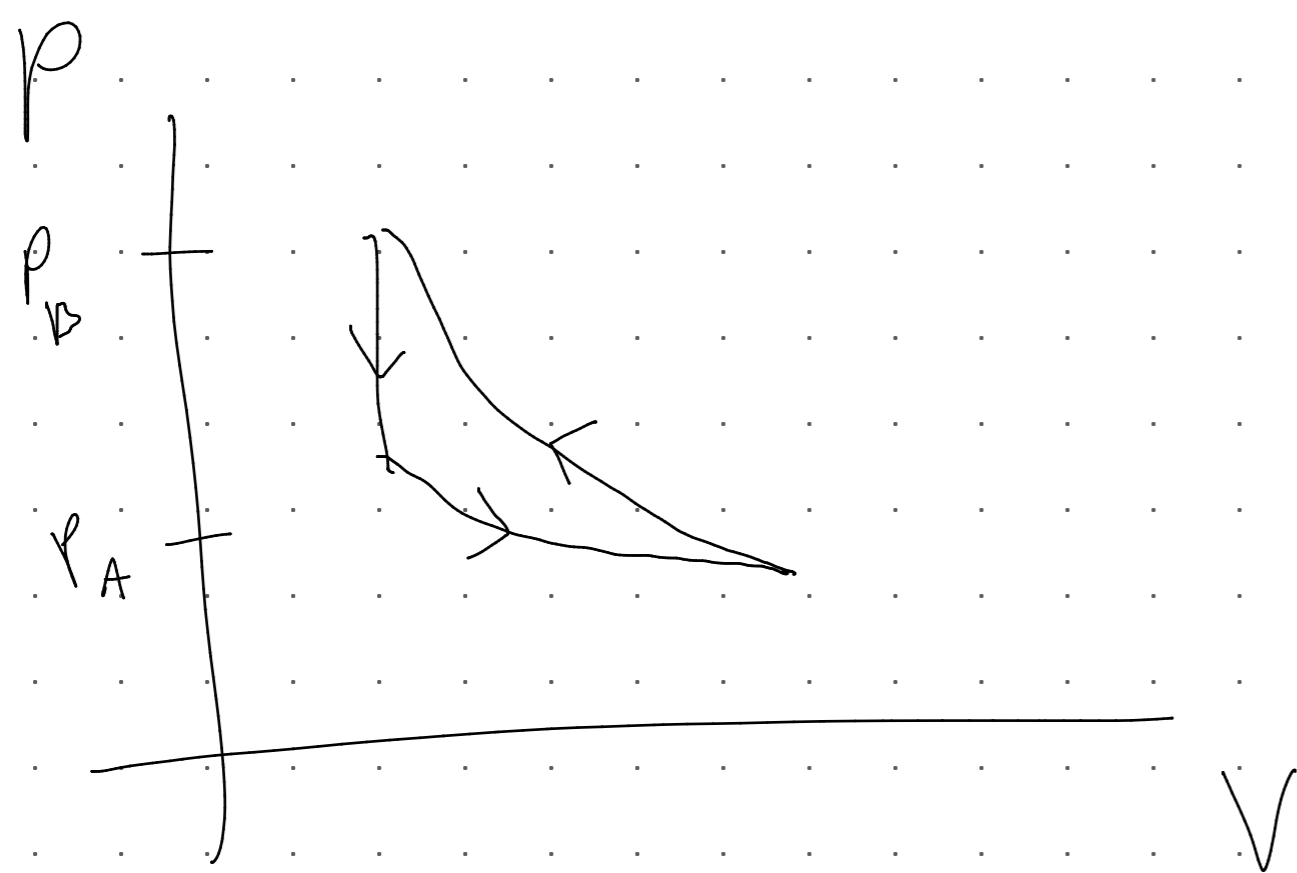
Exercice 6

Compression adiabatique

$$\gamma = \frac{5}{3}$$

isochore

isotherme



2) A → B

$$Q = 0$$

$$W = C_V \Delta T$$

$$W = \frac{mR}{\gamma - 1} (360 - 300)$$

$$= \frac{8,314}{\frac{5}{3} - 1} 60$$

$$= 748 \text{ J}$$

B → C

$$W = 0$$

$$Q = C_V \Delta T$$

$$Q = \frac{mR}{\gamma - 1} (300 - 360)$$

$$Q = -748$$

C → A

$$W = -Q$$

$$W = mRT \ln\left(\frac{V_i}{V_f}\right)$$

$$W = 8,314 \times 300 \ln\left(\frac{V_i}{V_f}\right)$$

$$T_A V_A^{\gamma-1} = T_B V_B^{\gamma-1}$$
$$\Leftrightarrow \frac{V_A}{V_B} = \left(\frac{T_B}{T_A}\right)^{\frac{1}{\gamma-1}}$$

$$= -682,1 \text{ J}$$



$$W_{\text{cycle}} = 748 + (-682)$$
$$= 66 \text{ J}$$

$$Q_{\text{cycle}} = -748 + 682$$
$$= -66 \text{ J}$$

$$\Delta U_{\text{cycle}} = Q_{\text{cycle}} + W_{\text{cycle}}$$
$$= 0 \text{ J}$$