from the graph, \( P \alpha \frac{1}{V} \Rightarrow T = \text{const. (isothermal)} \)

(However, we'll see that an adiabatic process looks like an isothermal only a little steeper)

\( a. \) \( P_1 = 3 \text{ atm} = 3.039 \times 10^5 \text{ Pa.} \)

\[ V_1 = 400 \text{ cm}^3 \left( \frac{1 \text{ m}}{100 \text{ cm}} \right)^3 = 4 \times 10^{-4} \text{ m}^3 \]

\[ PV = nRT \Rightarrow T_1 = \frac{P_1 V_1}{nR} = 731 \text{ K} = 458 \text{ \}^{\circ}C} \]

\[ \text{Note } T_1 = T_2 \]

\( b. \) \( 1 \Rightarrow 2 \quad T = \text{const.} \)

\[ \text{So, } PV = nRT = \text{const} \]

\[ \text{So, } P_1 V_1 = P_2 V_2 \Rightarrow V_2 = \frac{P_1 V_1}{P_2} = 1200 \text{ cm}^3 \]

Note, in part c, we can use pressure in atm. and volumes in cm³, but in part b since we are multiplying or dividing by \( R \), we must use MKS units.