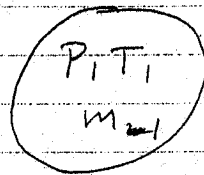
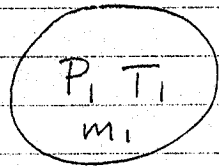


4 b.

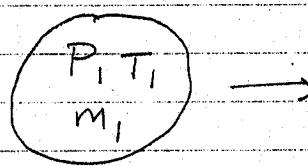
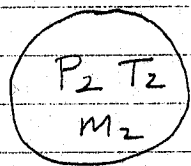
Initial state



$$P_1 = \rho_1 R T_1$$

$$m_1 = \rho_1 V$$

Second initial state

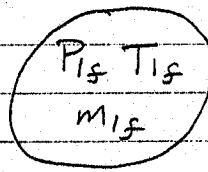
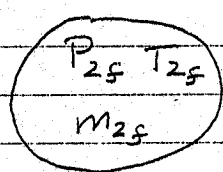


same

$$P_2 = \rho_2 R T_2 \quad m_2 = \rho_2 V$$

↳ related to state 1 by perfect gas relations

mass conservation after valve is opened



$$P_{2f} = P_{1f} \text{ at equilibrium}$$

$$m_1 + m_2 = m_{1f} + m_{2f}$$

$$\rho_1 V + \rho_2 V = \rho_{1f} V + \rho_{2f} V$$

$$\rho_1 + \rho_2 = \rho_{1f} + \rho_{2f}$$