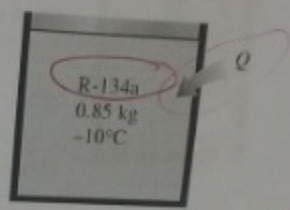


Q2) (10 points) A rigid tank of 41.99 liters volume contains 0.85 kg of refrigerant R-134a at (-10°C) . If heat is added such that the final state of the refrigerant is saturated vapor, then

- find the initial pressure, the final temperature and final pressure.
- Calculate work done and heat transfer during this process.
- show the process on a $T-v$ or $P-v$ diagram.



State	T [°C]	P [kPa]	v [m³/kg]	u [kJ/kg]
1	-10	200.74	0.0494	130.17
2	+10	414.89	0.0494	235.7

$$v_1 = \frac{0.04199}{0.85} \text{ m}^3/\text{kg}$$

$$x_1 = 0.49$$

$$u_g = u_2$$

Process	W (kJ)	Q (kJ)
1→2	0	89.7

$$u_1 = u_{lf} + x_1 u_{lg}$$

$$Q - W = m(u_2 - u_1)$$

$$= 0.85(105.5) = \underline{\underline{89.7 \text{ kJ}}}$$

