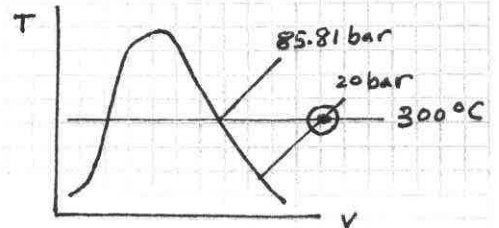
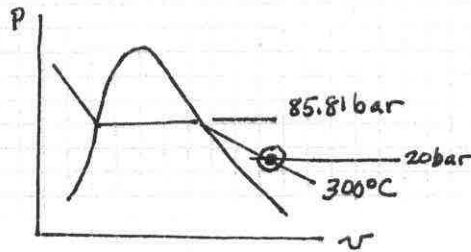


PROBLEM 3.42 Water is the substance.

(a) $p = 2 \text{ MPa}$, $T = 300^\circ\text{C}$, find u , in kJ/kg .

Table A-4:

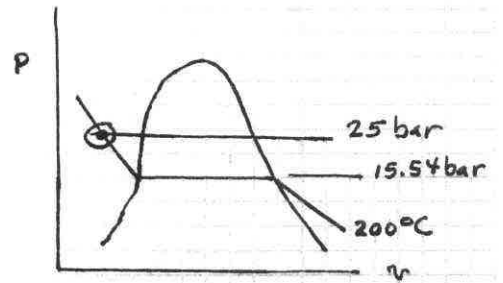
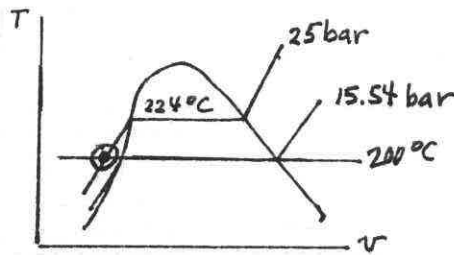
$$u = 2772.15 \frac{\text{kJ}}{\text{kg}}$$



(b) $p = 2.5 \text{ MPa}$, $T = 200^\circ\text{C}$, find u , in kJ/kg .

Table A-5:

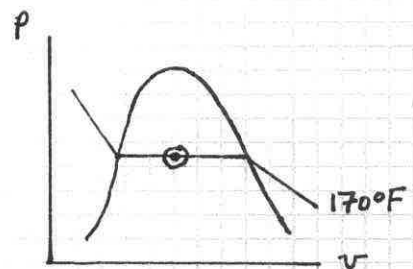
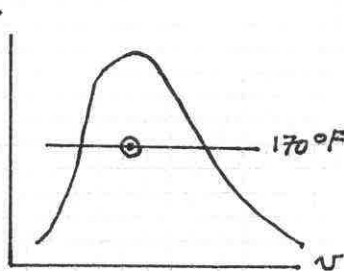
$$u = 849.9 \frac{\text{kJ}}{\text{kg}}$$



(c) $T = 170^\circ\text{F}$, $x = 50\%$, find u , in Btu/lb .

Table A-2E:

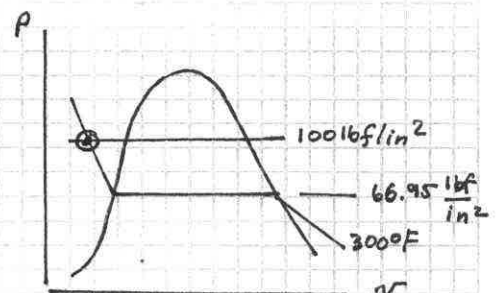
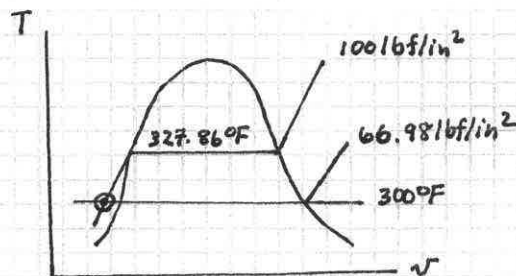
$$\begin{aligned} u_x &= u_f + x(u_g - u_f) \\ &= 137.95 + 0.5(1065.4 - 137.95) \\ &= 601.68 \frac{\text{Btu}}{\text{lb}} \end{aligned}$$



(d) $p = 100 \text{ lbf/in}^2$, $T = 300^\circ\text{F}$, find h , in Btu/lb .

Table A-2E:
With Eq. 3.14,

$$\begin{aligned} h &\approx h_f(T) \\ &= 269.7 \frac{\text{Btu}}{\text{lb}} \end{aligned}$$



(e) $p = 1.5 \text{ MPa}$, $v = 0.2095 \text{ m}^3/\text{kg}$, find h , in kJ/kg .

Table A-4E:
 $v_g = 0.1318 \text{ m}^3/\text{kg}$.

$$\begin{aligned} \Rightarrow v > v_g \\ h &= 3299.15 \text{ kJ/kg} \end{aligned}$$

