PROBLEM 3.10 For water...

(a) $p = 300$ kPa, $v = 0.5$ m³/kg. Find T in °C.

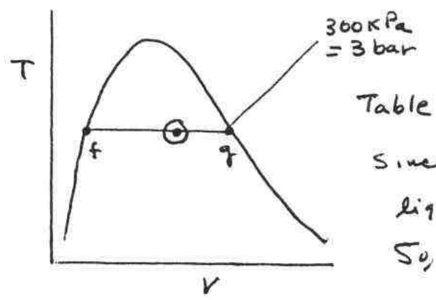
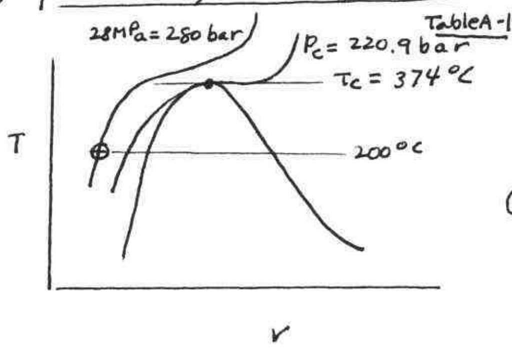


Table A-3, $v_f = 1.0732/10^3$ m³/kg, $v_g = 0.6058$ m³/kg.

Since $v_f < v < v_g$, the state is in the two-phase, liquid-vapor region, as shown on the T-v diagram.

So, $T = T_{sat}(3 \text{ bar}) = 133.6$ °C. ← T

(b) $p = 28$ MPa, $T = 200$ °C. Find v in m³/kg.



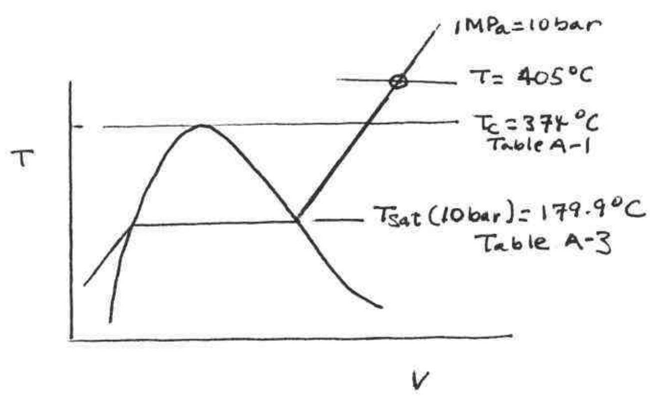
State is in Liquid region. From Table A-5,

	250 bar	300 bar
@ 200°C	$v = \frac{1.1344}{10^3}$	$v = \frac{1.1302}{10^3}$

So, at 280 bar

$$v \approx \frac{1.1319}{10^3} \frac{m^3}{kg}$$ ← v

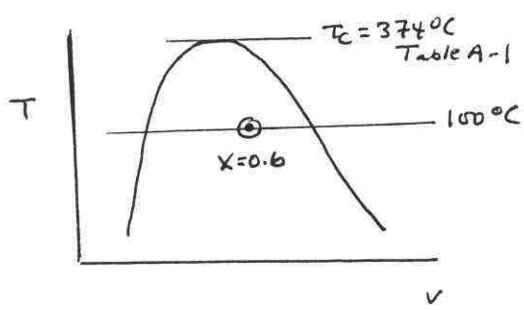
(c) $p = 1$ MPa, $T = 405$ °C. Find v in m³/kg.



From Table A-4 at 10 bar, interpolation gives

$$v = 0.309 \text{ m}^3/\text{kg}$$ ← v

(d) $T = 100$ °C, $x = 60\%$. Find v in m³/kg.



Eq. 3.2;

$$v_x = (1-x)\, v_f + x\, v_g$$

with data from Table A-2 at 100 °C,

$$v_x = 0.4\left[\frac{1.0435}{10^3}\right] + 0.6\left[1.673\right]$$

$$= 1.0042 \text{ m}^3/\text{kg}$$ ← v