PROBLEM 3.12

(a) Water. $v = 0.5\ m^3/kg$, $p = 3$ bar. Find T in °C.

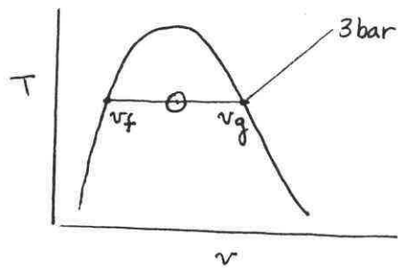

Table A-3, $v_f = 1.0732/10^3\ m^3/kg$, $v_g = 0.6058\ m^3/kg$.
Since $v_f < v < v_g$, the state is in the two-phase, liquid-vapor region — see T-v diagram.
Thus, $T = T_{sat}(3\text{ bar}) = 133.6°C$ ← T

(b) Ammonia. $p = 11\ lbf/in^2$, $T = -20°F$. Find v in ft^3/lb.

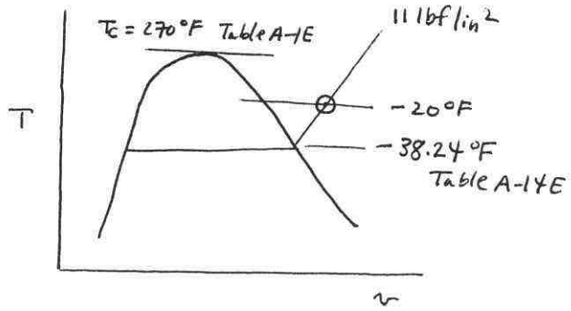

Table A-15E

	$10\ lbf/in^2$	$12\ lbf/in^2$
$-20°F$	$v = 27.241\ ft^3/lb$	$v = 22.621\ ft^3/lb$

⇒ at $11\ lbf/in^2$

$v = 24.931\ ft^3/lb$ ← v

(c) Propane. $p = 1$ MPa, $T = 85°C$. Find v in m^3/kg.

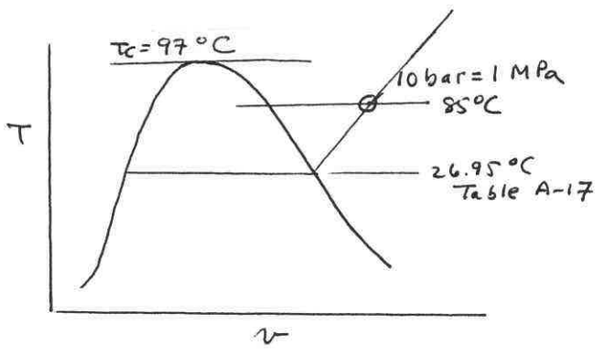

Table A-18 at 10 bar:

	10 bar
80°C	$v = 0.05992\ m^3/kg$
85°C	- - - -
90°C	$v = 0.06226\ m^3/kg$

⇒ $v = 0.06109\ m^3/kg$ ← v