

Exercise 2—Table lookup practice:

Provide the information requested in the table for *water*. Use the following abbreviations where needed:

- CL – compressed (subcooled) liquid
- SL – saturated liquid
- SM – saturated mixture
- SV – saturated vapor
- SHV – superheated vapor
- NA – not applicable
- INSUF – insufficient information given

State	Phase	Pressure, P [MPa]	Temperature, T [°C]	Specific volume, v [m ³ /kg]	Specific enthalpy, h [kJ/kg]	Quality, x
1	SV	3.973	250	0.05013	2801.5	1
2	SM	3.973	250		2286.7	0.70
3	SHV	3.0	250	0.0704	2850.8	NA
4	SM	3.0	233.9	0.02500	1660.8	0.3633
5	CL	3.0	100	0.001042	421.22	NA
6	SHV	3.0	362.7	0.09279	3145.1	NA

- 1)
- 2) $h = (1-x)h_f + xh_g = (1-0.70)(1085.4) + 0.7(2801.5) = 2286.7$
- 3) $\frac{v - 0.0682}{0.0771 - 0.0682} = \frac{250 - 240}{280 - 240} = \frac{h - 2824.3}{2941.3 - 2824.3}$
- 4) $0.02500 = (1-x)(0.0012145) + x(0.06668)$
 $v = (1-x)v_f + xv_g \quad x = 0.3633$
 $h = h_f + xh_{fg} = (1-x)h_f + xh_g$
 $= (1008.4) + (0.3633)[1795.7] = (1-0.3633)(1008.4)$
 $+ (0.3633)(2804.2)$
 $= 1660.8$

$$5) \frac{v - 0.0010423}{0.0010410 - 0.0010423} = \frac{3 - 2.5}{5 - 2.5}$$

$$\frac{h - 420.85}{422.72 - 420.85} = 0.2$$

$$422.72 - 420.85$$

$$v = 0.001042$$

$$h = 421.22$$

$$6) \frac{3145.1 - 3138.7}{3230.9 - 3138.7} = \frac{T - 360}{400 - 360} = 0.069414$$

$$T = 362.7 \text{ } \leftarrow$$

$$= \frac{v - 0.0923}{0.0994 - 0.0923}$$

$$v = 0.09279$$