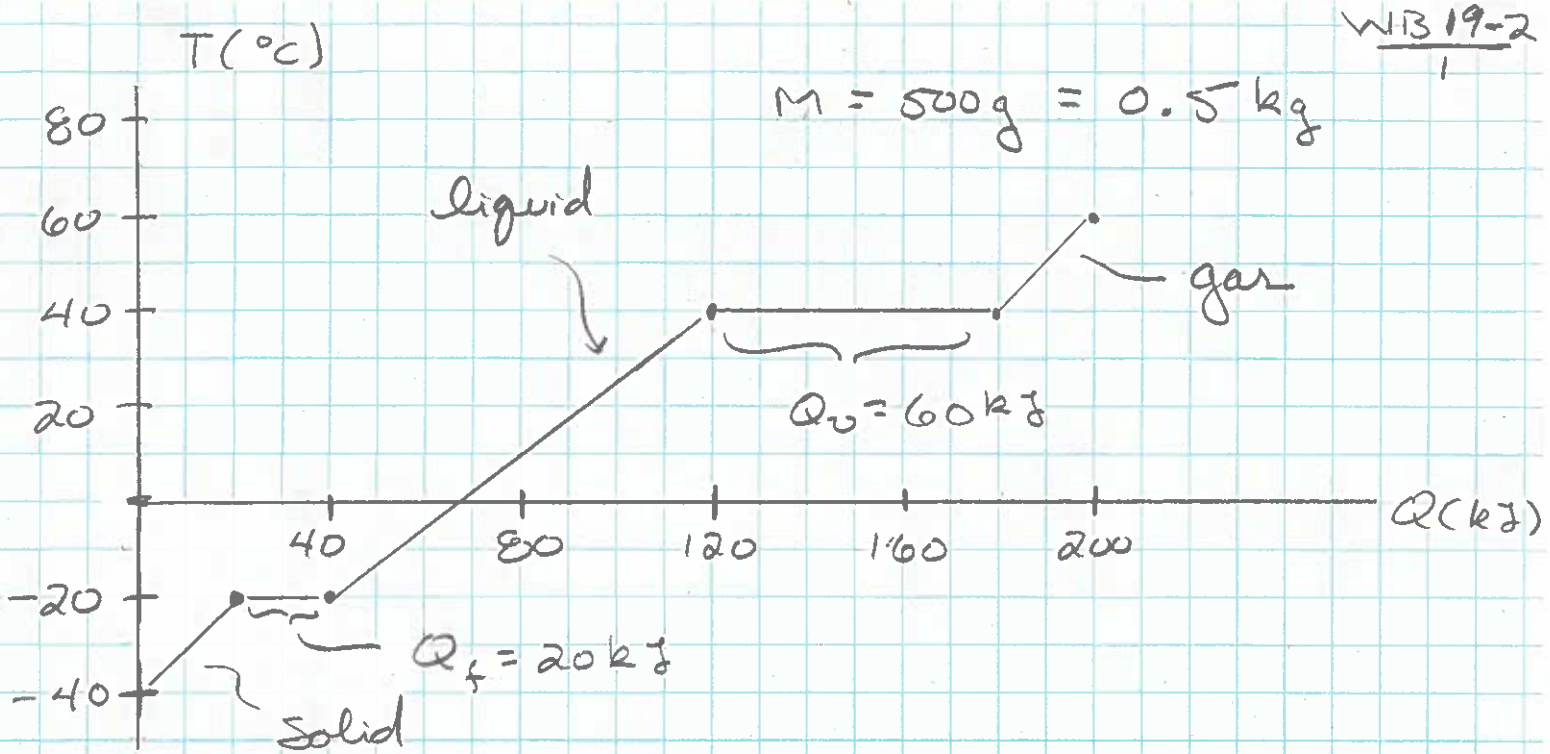

$M = 500\,g = 0.5\,kg$

a, b) from the graph: melting point $= -20°C$

boiling point $= 40°C$

$Q = MC\Delta T \Rightarrow C = \dfrac{Q}{M\Delta T}$

c.) Solid: $\Delta T = 20°$, $Q = 20\,kJ$

$C = 2000\ \dfrac{J}{kg\,°C}$

d.) Liquid: $\Delta T = 60°$, $Q = 120 - 40\,kJ = 80\,kJ$

$C = 2670\ \dfrac{J}{kg\,°C}$

e.) Heat of fusion: $Q = ML_f \Rightarrow L_f = Q/M$

$Q = 40 - 20\,kJ = 20\,kJ$

$L_f = 40{,}000\ J/kg$

f.) Heat of vaporization: $L_v = \dfrac{Q_v}{M} = 120{,}000\ J/kg$.