P #N

Ch. 12

$P_A = P_B = 2.0 \times 10^5\ Pa$ $\quad P_C = 1.0 \times 10^5\ Pa$

$V_A = V_C = 48 \times 10^{-3}\ m^3$ $\quad V_B = 24 \times 10^{-3}\ m^3$

a) $W = -P \cdot \Delta V$ for $A \rightarrow B$

$= -(2.0 \times 10^5\ Pa)((24 \times 10^{-3}\ m^3) - (48 \times 10^{-3}\ m^3))$

$\boxed{W_{AB} = +4800\ J}$

b) $W = +4800\ J$

$\Delta U = -7200\ J$

$Q = ?$

$\Delta U = W + Q$

$-7200\ J = (+4800\ J) + Q$

$\boxed{Q_{AB} = -12{,}000\ J}$

c) $W = -P \cdot \Delta V$ for AC $\quad \Delta V = 0$

$= -P \cdot (0)$

$\boxed{W_{AC} = 0}$

d) $W = 0$

$\Delta U = -7200\ J$

$Q = ?$

$\Delta U = W + Q$

$-7200\ J = 0 + Q$

$\boxed{Q_{AC} = -7200\ J}$