P #G

Ch 12 Worksheet

g) $W = -P \cdot \Delta V$

$= -(2 \times 10^5 \text{ Pa})((2 \times 10^{-3} \text{ m}^3) - (5 \times 10^{-3} \text{ m}^3))$

$\boxed{W_{CD} = +600 \text{ J}}$

h) $\Delta KE = \frac{3}{2} \cdot k_B \cdot \Delta T$ OR $\Delta U = \frac{3}{2} \cdot n \cdot R \cdot \Delta T$

$\Delta U = \frac{3}{2} \cdot (.48 \text{ mol})(8.31 \text{ J/mol K})(100 \text{ K} - 250 \text{ K})$

$\boxed{\Delta U_{CD} = -900 \text{ J}}$

i) $\Delta U = W + Q$

$-900 \text{ J} = (+600 \text{ J}) + Q$

$\boxed{Q_{CD} = -1500 \text{ J}}$

j) $\boxed{W_{DA} = 0 \text{ J}}$ $(\Delta V = 0)$

k) $\Delta U = \frac{3}{2} \cdot n \cdot R \cdot \Delta T$

$= \frac{3}{2} \cdot (.48 \text{ mol})(8.31 \text{ J/mol K})(200 \text{ K} - 100 \text{ K})$

$\boxed{\Delta U_{DA} = +600 \text{ J}}$

l) $\Delta U = W + Q$

$+600 \text{ J} = (0 \text{ J}) + Q$

$\boxed{Q_{DA} = +600 \text{ J}}$