P # D

Ch 12 Worksheet

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

$= \frac{3}{2} \cdot \Delta(P \cdot V)$ (since $P \cdot V = nRT$)

a) $\Delta U_{AY} = \frac{3}{2} \cdot (10 \times 10^{-3}\ m^3)((.8 \times 10^5\ Pa) - (.4 \times 10^5\ Pa))$

$\boxed{\Delta U_{AY} = +600\ J}$

b) $\Delta U_{AZ} = \frac{3}{2} \cdot (.4 \times 10^5\ Pa)((20 \times 10^{-3}) - (10 \times 10^{-3}))$

$\boxed{\Delta U_{AZ} = +600\ J}$

c) $\Delta U_{AY} = +600\ J$
$W_{AY} = 0 \quad (\Delta V = 0)$

$\Delta U = W + Q$
$600\ J = 0 + Q$ $\boxed{Q_{AY} = +600\ J}$

d) $\Delta U_{AZ} = +600\ J$

$W_{AZ} = -P \cdot \Delta V = -(.4 \times 10^5\ Pa)((20 \times 10^{-3}\ m^3) - (10 \times 10^{-3}\ m^3))$
$= -400\ J$

$\Delta U = W + Q$

$+600\ J = -400\ J + Q$

$\boxed{Q_{AZ} = +1000\ J}$