$P = 6000 \, Pa$

$\Delta V = (.150 \, m^2)(-.20 \, m) = -.03 \, m^3$

$W = P \cdot \Delta V$

$= (6000 \, Pa)(-.03 \, m^3)$

$\boxed{W = +180 \, J}$

b) $W = +180 \, J$

$\Delta U = -8.00 \, J$

$\Delta U = Q + W$

$-8 \, J = Q + 180 \, J$

$\boxed{Q = -188 \, J}$