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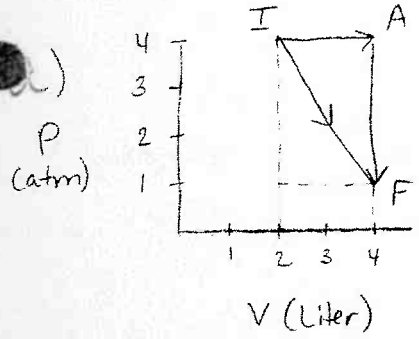
a)



Find Work using the area under the graph:

$W = -\frac{1}{2}(2\,L \times 3\,atm) + -(2\,L \times 1\,atm)$

$= -\frac{1}{2}(.002\,m^3 \times 3\times10^5\,Pa) + -(.002\,m^3 \times 1\times10^5\,Pa)$

$W = -500\,J$

$Q = 418\,J$

$\Delta U = Q + W$

$= (418\,J) + -(500\,J)$

$\boxed{\Delta U = -82\,J}$

b) Find Work for IAF using the area under the graph:

$W = -(2\,L \times 4\,atm)$

$= -(.002\,m^3 \times 4.0\times10^5\,Pa)$

$W = -800\,J$

$\Delta U = -82\,J$ (same as Part a)

$\Delta U = Q + W$ so $-82\,J = Q + -800\,J$

$\boxed{Q = 718\,J}$