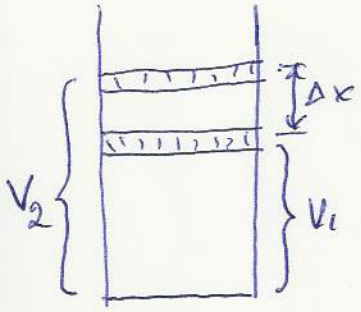
Θέμα Δ



$V_1 = 3 \cdot 10^{-3}\ m^3$

$T_1 = 300K$

$T_2 = 400K$.

α) $\frac{V_1}{T_1} = \frac{V_2}{T_2} \Rightarrow V_2 = \frac{V_1 \cdot T_2}{T_1} = 4 \cdot 10^{-3}\ m^3$.

$\Delta V = V_2 - V_1 \Rightarrow S \cdot \Delta x = V_2 - V_1 \Rightarrow$

$\Delta x = \frac{V_2 - V_1}{S} = \frac{10^{-3}}{200 \cdot 10^{-4}} = \frac{1}{20} = 0{,}05\ m$

β) $W = P\Delta V = \left(P_0 + \frac{B}{S}\right)\Delta V = \left(10^5 + \frac{400}{200 \cdot 10^{-4}}\right) 10^{-3}$.

$W = 120\ J$

γ) $\frac{\Delta U}{\Delta T} = \frac{\frac{3}{2} nR\Delta T}{\Delta T} = \frac{3}{2} nR = \frac{3}{2} \frac{PV}{T} \Rightarrow$

$\frac{\Delta U}{\Delta t} = \frac{3}{2} \cdot \frac{\left(10^5 + \frac{400}{200 \cdot 10^{-4}}\right) \cdot 3 \cdot 10^{-3}}{300}$

$= \frac{9}{2} \cdot \frac{10^{-3} \cdot 12 \cdot 10^4}{300} = \frac{120 \cdot 9}{2 \cdot 300} = 1{,}8$