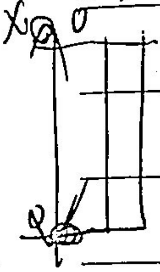
295.8-1

$PV = C$. ~~$V' = \frac{C}{P'} = \frac{PV}{P'} = 390\,V$~~

$P_1V_1 = C'$ $\quad P' \cdot V = C - nC' = PV - nP_1V_1 \Rightarrow n = 9$

295.8-2



~~$T = 1000 - 800\frac{x}{L_0}$~~ ~~$C = B\frac{1}{2}\sigma V_0$~~ $T = 200 + \frac{800}{L}x$.

~~$\Sigma P_0 \sigma V = \Sigma A R T_i \Rightarrow n(x) = P_0 \sigma x$~~

$P = nk_BT \Rightarrow n(x) = \frac{P_0}{k_B T(x)} =$ ~~$\frac{P_0}{k_B(1000 - 800\frac{x}{L_0})}$~~ $\frac{P_0}{k_0(200 + \frac{800}{L_0}x)}$

$N = \int n(x)\,dx = \frac{\ln 5}{800}\frac{P_0 S L_0}{k_B}$, $\bar{n} = \frac{\ln 5}{800}\frac{P_0}{k_B}$

$P' = \bar{n}k_BT \Rightarrow P' = \frac{\ln 5}{8}P_0$

~~295.8-3~~

~~$PV = NRT \quad \frac{N'}{N_0} = \frac{P'}{P_0} = 10^{-3}$~~

~~经过 dt(min)，抽 $20t$(L) 气体.~~

~~$PV - P'V = NRT(N - 20t\cdot\frac{NRT}{P}) = NRT -$~~

~~$(P - dP)V = NRT(N - \frac{PV\cdot 20t}{RT}) = NRT - P\cdot\sigma V$.~~

$\Rightarrow$ ~~$P'V = P_0V \Rightarrow (P + dP)V = PdV$~~

295.8-3.

$PV = RT(N - \frac{20t\,P_0}{RT}) \Rightarrow P = P_0 + dP$.

$\Rightarrow VdP = -2PdT \Rightarrow P = P_0e^{-\frac{1}{2}t}$. $P_0 = 10^5 P_a$ $P_n' = 100\,P_a$

$\therefore t = 6\ln 10$ (min)

295.8-4

$H_0 \cdot L \cdot S = \text{Const}.$ ~~$\frac{1}{2}L \cdot 2H_0 \cdot S \quad C \cdot L$~~ $C/\frac{L}{2} \sim 2H_0$, $C/\frac{3}{2}L \sim \frac{2}{3}H_0$

$\therefore F =$ ~~$(2H_0 - \frac{2}{3}H_0)S$~~ $= m\omega^2 \cdot 2L$

$= \rho_{Hg}g(2H_0 - \frac{2}{3}H_0) = \rho_{Hg}gS \cdot L\omega^2 \cdot 2L \Rightarrow \omega = \sqrt{\frac{2gH_0}{3L^2}}$