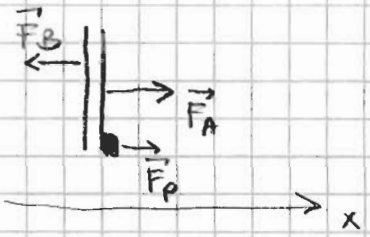
Esercizio su gas perfetto

T_0 cost. S noto

1) F esercitata dal pistone
2) tolgo pistone, $V_{A,f}$ e $V_{B,f}$, P_f (T resta cost)

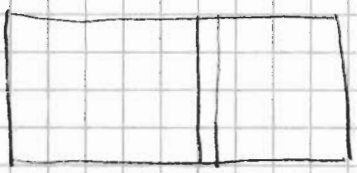
1) $P_A = \frac{m_A R T_0}{V_A}$; $P_B = \frac{m_B R T_0}{V_B}$



$\vec{F}_A + \vec{F}_B + \vec{F}_p = 0$

$F_p = P_B S - P_A S$

$= \left(\frac{m_B}{V_B} - \frac{m_A}{V_A} \right) R T_0 S$

2) 

$P_{A,f} = P_{B,f} = P_f$

$V_{A,f} + V_{B,f} = V_A + V_B$

$\frac{P_{A,f} V_{A,f}}{R T_0} = m_A$

$\frac{P_{B,f} V_{B,f}}{R T_0} = m_B$

$\Rightarrow$ $V_{A,f} = \frac{R T_0 m_A}{P_f}$; $V_{B,f} = \frac{R T_0 m_B}{P_f}$

$\frac{R T_0}{P_f} (m_A + m_B) = V_A + V_B$

$\Rightarrow$ $P_f = R T_0 \frac{m_A + m_B}{V_A + V_B}$

$V_{A,f} = m_A \frac{V_A + V_B}{m_A + m_B}$

$V_{B,f} = m_B \frac{V_A + V_B}{m_A + m_B}$