17. When the valve is closed the number of moles of the gas in container $A$ is $n_A = p_A V_A / RT_A$ and that in container $B$ is $n_B = 4p_B V_A / RT_B$. The total number of moles in both containers is then

$$n = n_A + n_B = \frac{V_A}{R}\left(\frac{p_A}{T_A} + \frac{4p_B}{T_B}\right) = \text{const.}$$

After the valve is opened the pressure in container $A$ is $p'_A = Rn'_A T_A / V_A$ and that in container $B$ is $p'_B = Rn'_B T_B / 4V_A$. Equating $p'_A$ and $p'_B$, we obtain $Rn'_A T_A / V_A = Rn'_B T_B / 4V_A$, or $n'_B = (4T_A/T_B) n'_A$. Thus,

$$n = n'_A + n'_B = n'_A\left(1 + \frac{4T_A}{T_B}\right) = n_A + n_B = \frac{V_A}{R}\left(\frac{p_A}{T_A} + \frac{4p_B}{T_B}\right) .$$

We solve the above equation for $n'_A$:

$$n'_A = \frac{V}{R}\frac{(p_A/T_A + 4p_B/T_B)}{(1 + 4T_A/T_B)} .$$

Substituting this expression for $n'_A$ into $p'V_A = n'_A RT_A$, we obtain the final pressure:

$$p' = \frac{n'_A RT_A}{V_A} = \frac{p_A + 4p_B T_A/T_B}{1 + 4T_A/T_B} = 2.0 \times 10^5 \text{ Pa} .$$