

8. Since (standard) air pressure is 101 kPa, then the initial (absolute) pressure of the air is  $p_i = 266$  kPa. Setting up the gas law in ratio form (where  $n_i = n_f$  and thus cancels out – see Sample Problem 20-1), we have

$$\frac{p_f V_f}{p_i V_i} = \frac{T_f}{T_i} \implies p_f = (266 \text{ kPa}) \left( \frac{1.64 \times 10^{-2} \text{ m}^3}{1.67 \times 10^{-2} \text{ m}^3} \right) \left( \frac{300 \text{ K}}{273 \text{ K}} \right)$$

which yields  $p_f = 287$  kPa. Expressed as a gauge pressure, we subtract 101 kPa and obtain 186 kPa.