9. (a) With $T = 283$ K, we obtain

$$n = \frac{pV}{RT} = \frac{\left(100 \times 10^3\,\mathrm{Pa}\right)\left(2.50\,\mathrm{m}^3\right)}{\left(8.31\,\frac{\mathrm{J}}{\mathrm{mol\cdot K}}\right)(283\,\mathrm{K})} = 106 \text{ mol} .$$

(b) We can use the answer to part (a) with the new values of pressure and temperature, and solve the ideal gas law for the new volume, or we could set up the gas law in ratio form as in Sample Problem 20-1 (where $n_i = n_f$ and thus cancels out):

$$\frac{p_f V_f}{p_i V_i} = \frac{T_f}{T_i} \implies V_f = \left(2.50\,\mathrm{m}^3\right)\left(\frac{100\,\mathrm{kPa}}{300\,\mathrm{kPa}}\right)\left(\frac{303\,\mathrm{K}}{283\,\mathrm{K}}\right)$$

which yields a final volume of $V_f = 0.892$ m^3.