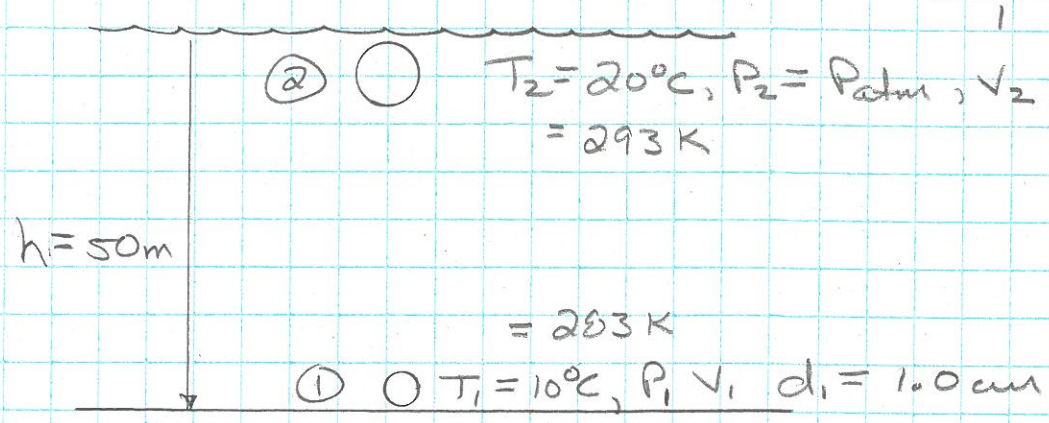

at bottom (point 1):

$$V_1 = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi\left(\frac{d}{2}\right)^3 = 5.236\times10^{-7}\,m^3$$

from chap 15: $P_1 = P_{atm} + \rho_{water}\,g\,h$

$$= 5.913\times10^5\,Pa$$

($\rho_{water} = 1000\,kg/m^3$)

Now, for bubble going $1 \to 2$, only n is const.
So

$$PV = nRT \Rightarrow nR = \frac{PV}{T} = \text{const.}$$

$$\therefore \quad \frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2} \Rightarrow V_2 = \left(\frac{T_2}{T_1}\right)\left(\frac{P_1}{P_2}\right)V_1 = 6.043\,V_1$$

$$= 3.164\times10^{-6}\,m^3$$

Now,

$$V_2 = \frac{4}{3}\pi\left(\frac{d_2}{2}\right)^3 = \frac{\pi}{6}d_2^3$$

$$d_2 = \left(\frac{6V_2}{\pi}\right)^{1/3} = 0.01821\,m$$

$$= 1.821\,cm$$