2 **(a)** The equation of state for an ideal gas of volume V at pressure p is

$$pV = nRT$$

where R is the molar gas constant.

State what is meant by

(i) the symbol n,

.....

.....[1]

(ii) the symbol T.

.....

.....[1]

(b) An ideal gas is held in a container of volume $2.4 \times 10^3\,\text{cm}^3$ at pressure $4.9 \times 10^5\,\text{Pa}$. The temperature of the gas is 100 °C.

Show that the number of molecules of the gas in the container is 2.3×10^{23}.

[3]

(c) Use data from **(b)** to estimate the mean distance between molecules in the gas.

mean distance = ... cm [3]

[Total: 8]