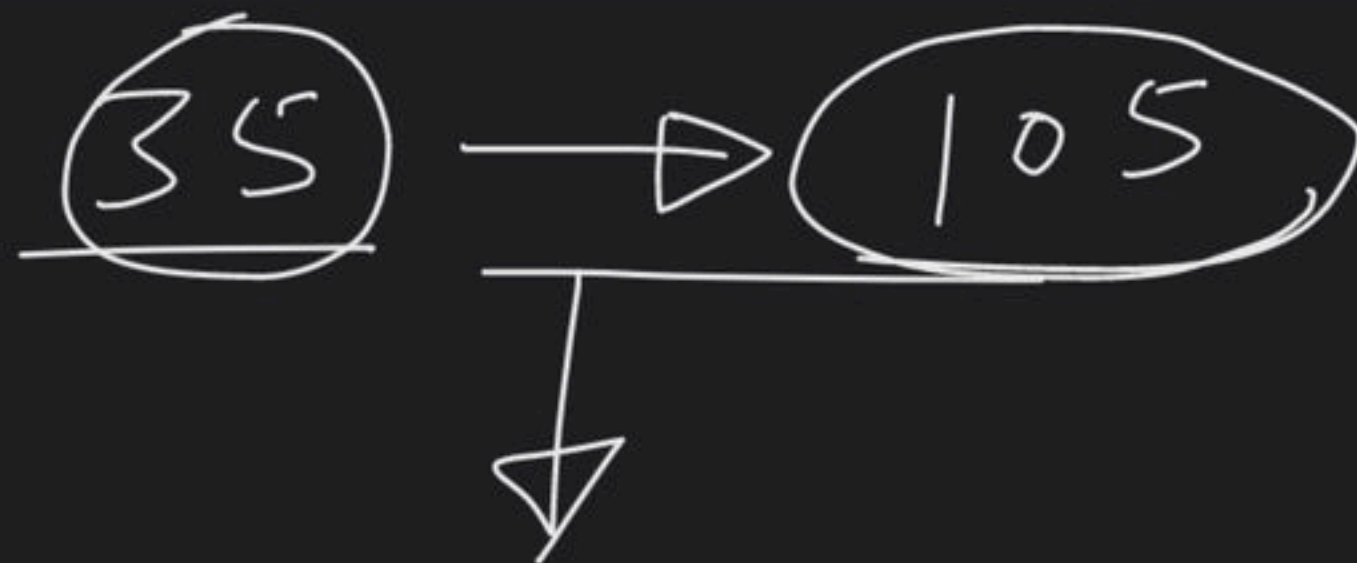




Doubt Clearing Session

Course on States of Matter for Class XI



29

$$\frac{3}{2} \times \left(\frac{R}{N_A} \right) \times 300 \times \frac{1}{1.6 \times 10^{-19}} \text{ eV}$$

30 →

31

→

$$\lambda = \frac{RT}{\sqrt{2} \pi \sigma^2 p N_A}$$

③ (B)

any particular range \rightarrow False

② (C)

to sq root of mol. weight of gas
 \downarrow True

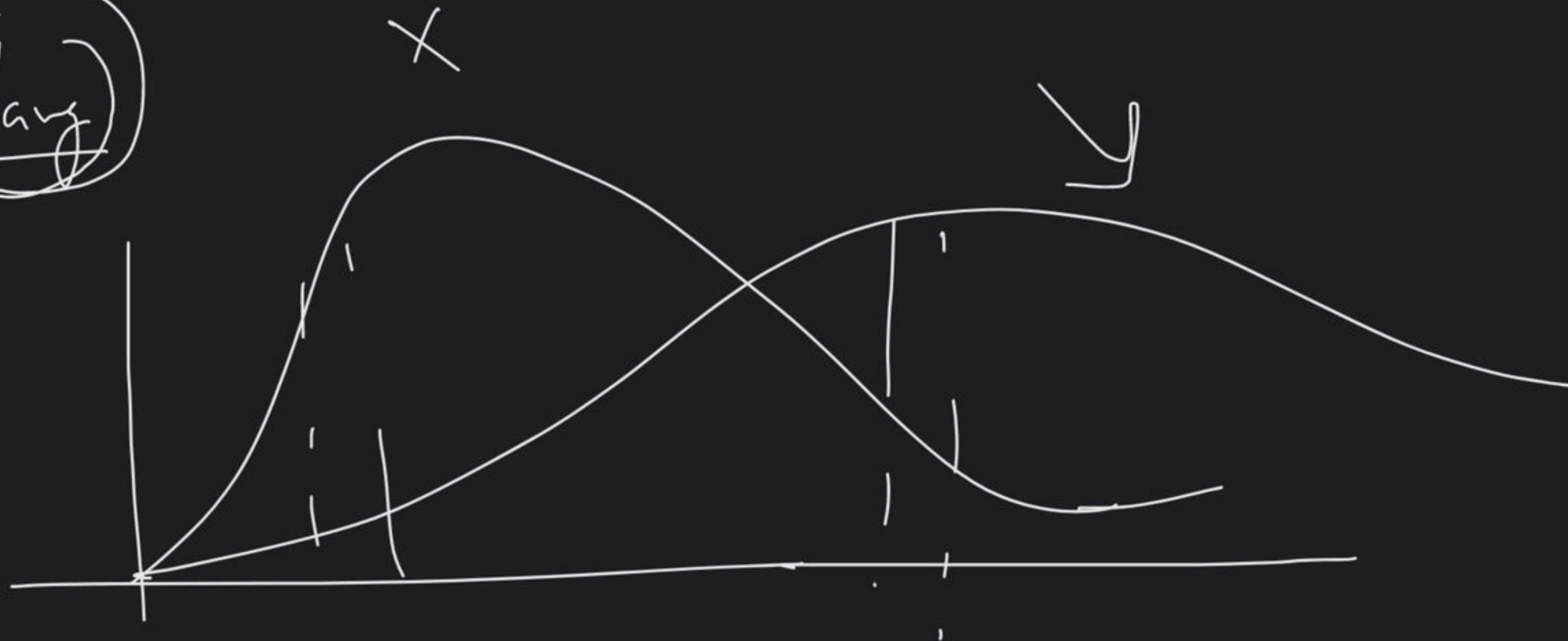
$$\gamma \propto \frac{1}{\sqrt{\kappa}}$$

$$\gamma = 3\kappa^2$$

3

B

V_{avg}



$M_x > M_y$

$T \uparrow$
const p

$V \uparrow$

$\lambda \uparrow$

$Z_1 \downarrow$

$Z_{11} \downarrow$

V_{rel} \rightarrow False

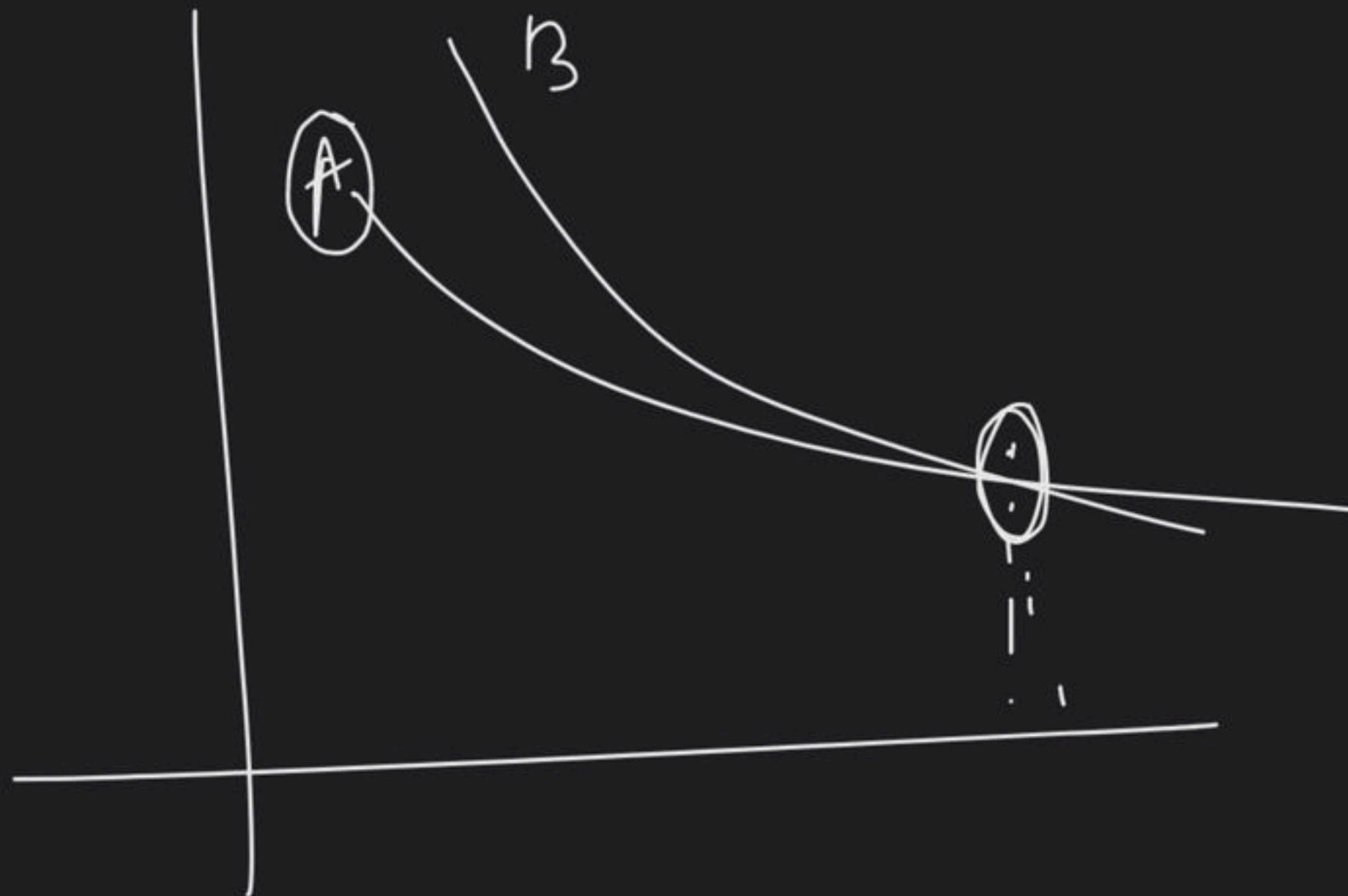
\perp
 90°

$$M_A > M_B$$

ABD

$$r_A < r_B$$

	(A)	(B)
5	_____	10
4	_____	8
3	_____	6



$$\frac{e^{-2\kappa}}{e^{-3\kappa}}$$

$$\underline{N_t = N_0 e^{-ct}}$$

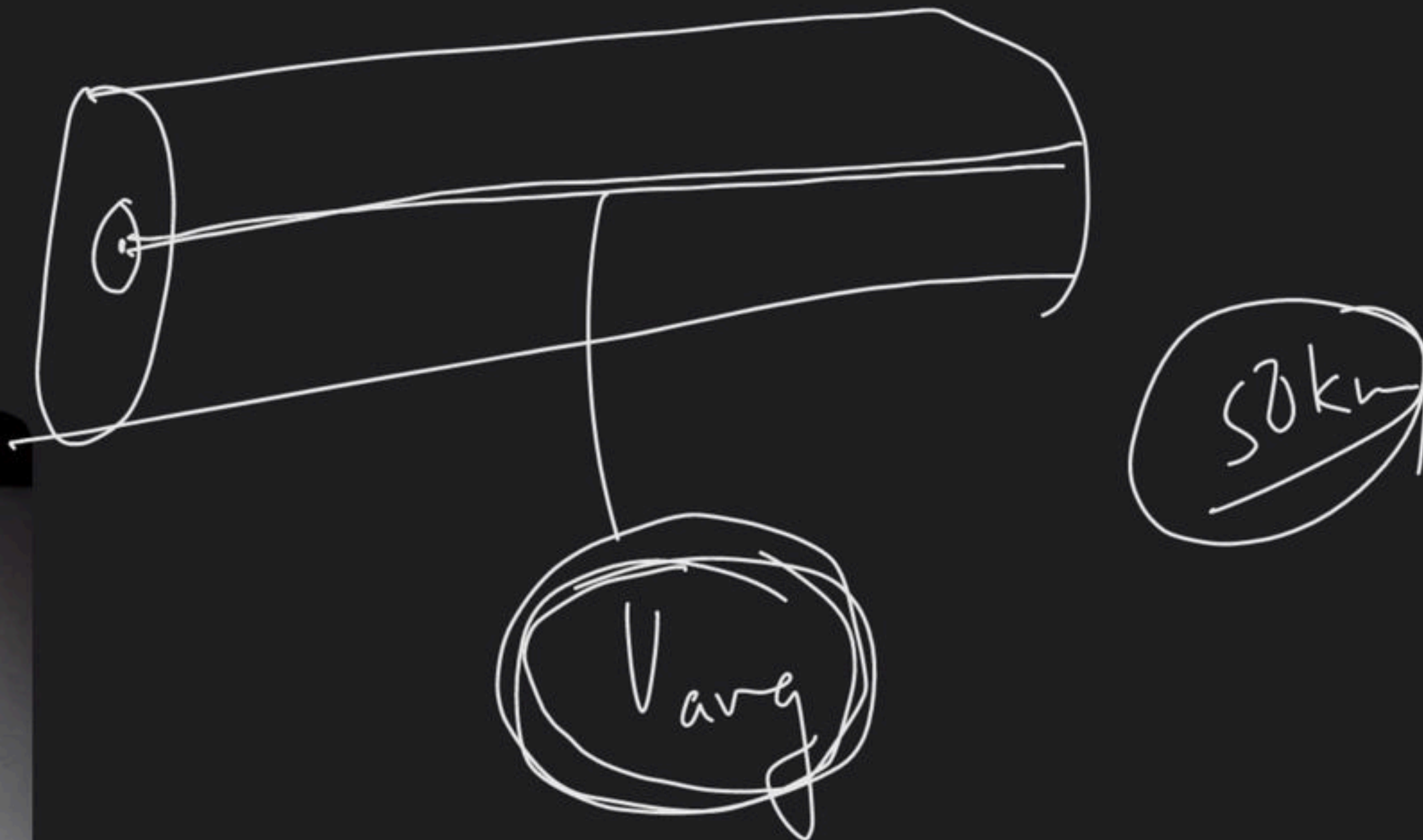
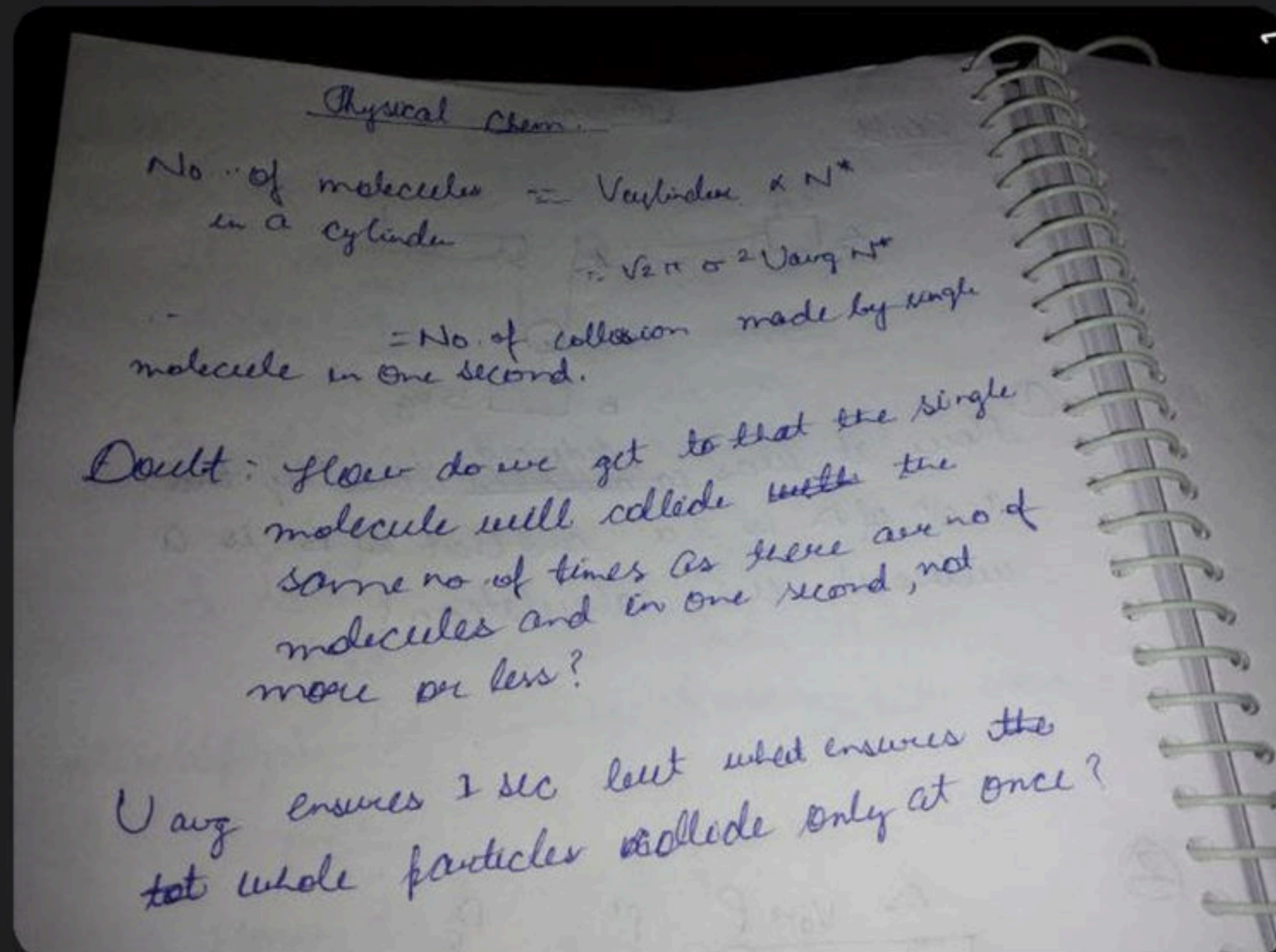
Real Gases : \rightarrow



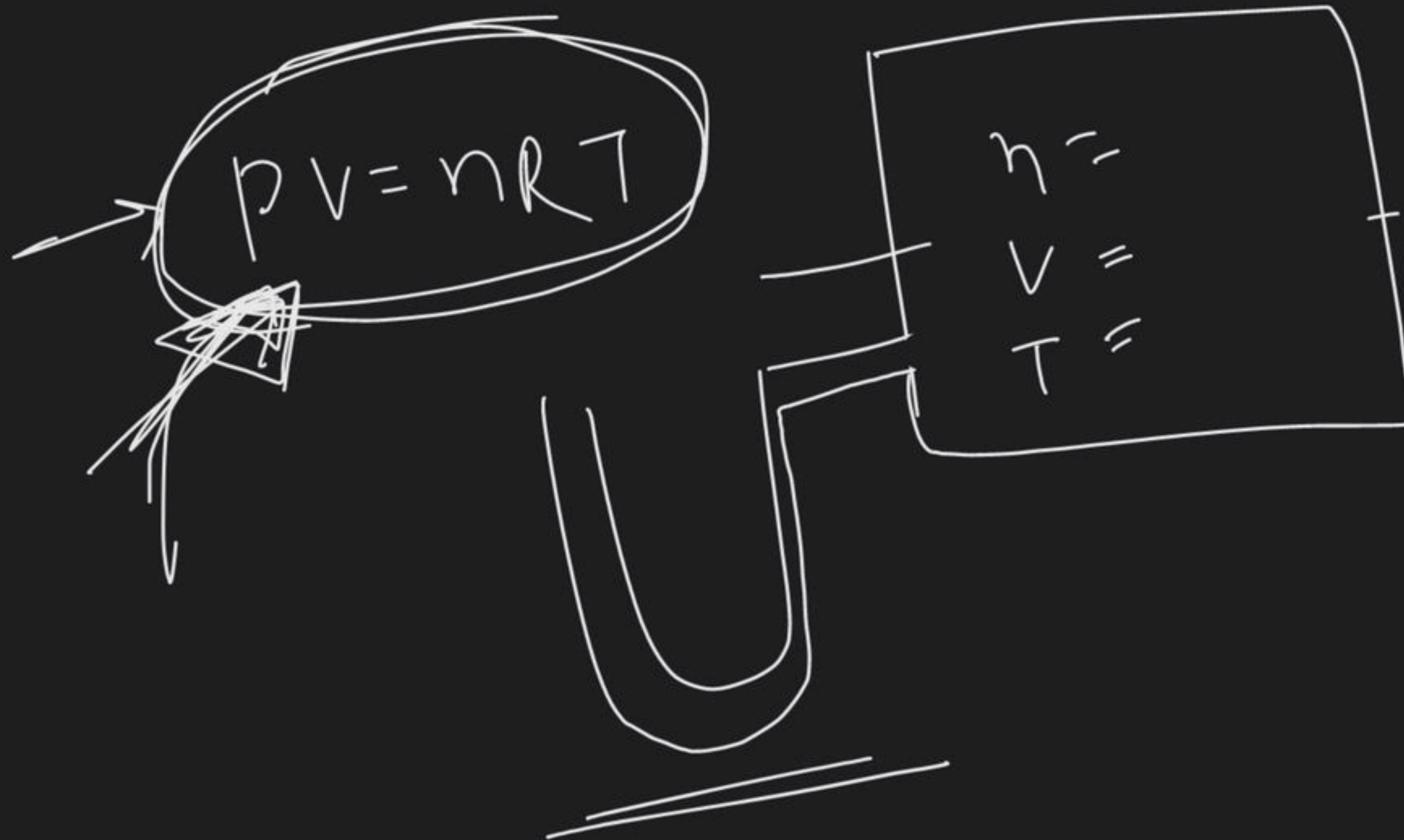
Question

from Alok

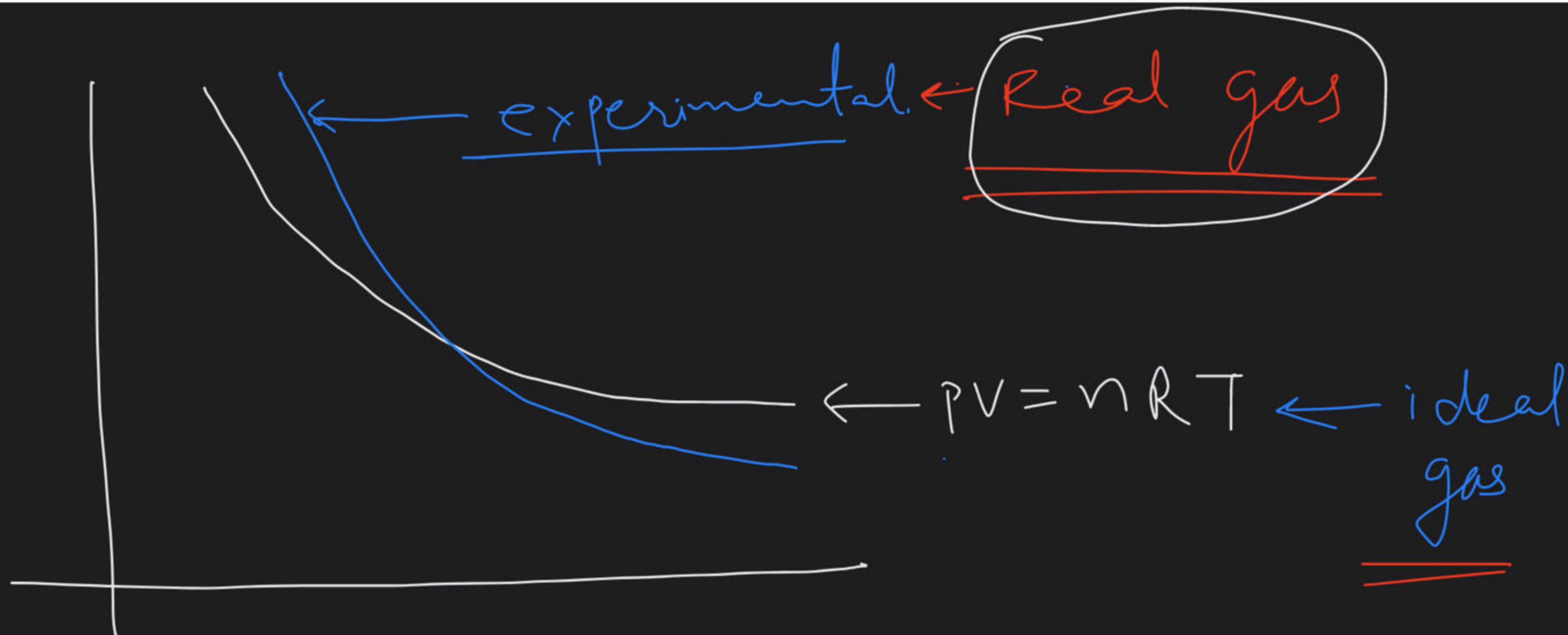
Sir please explain



Real Gases:



P



Ideal gas → which follows
 $PV = nRT$ eqn

Vander Waal's eqⁿ : →

Cause of deviation → Vander Waal points
out following two assumption

- ① Intermolecular force betⁿ molecules
can not neglected.
- ② Volume of gaseous
molecules is also
not negligible

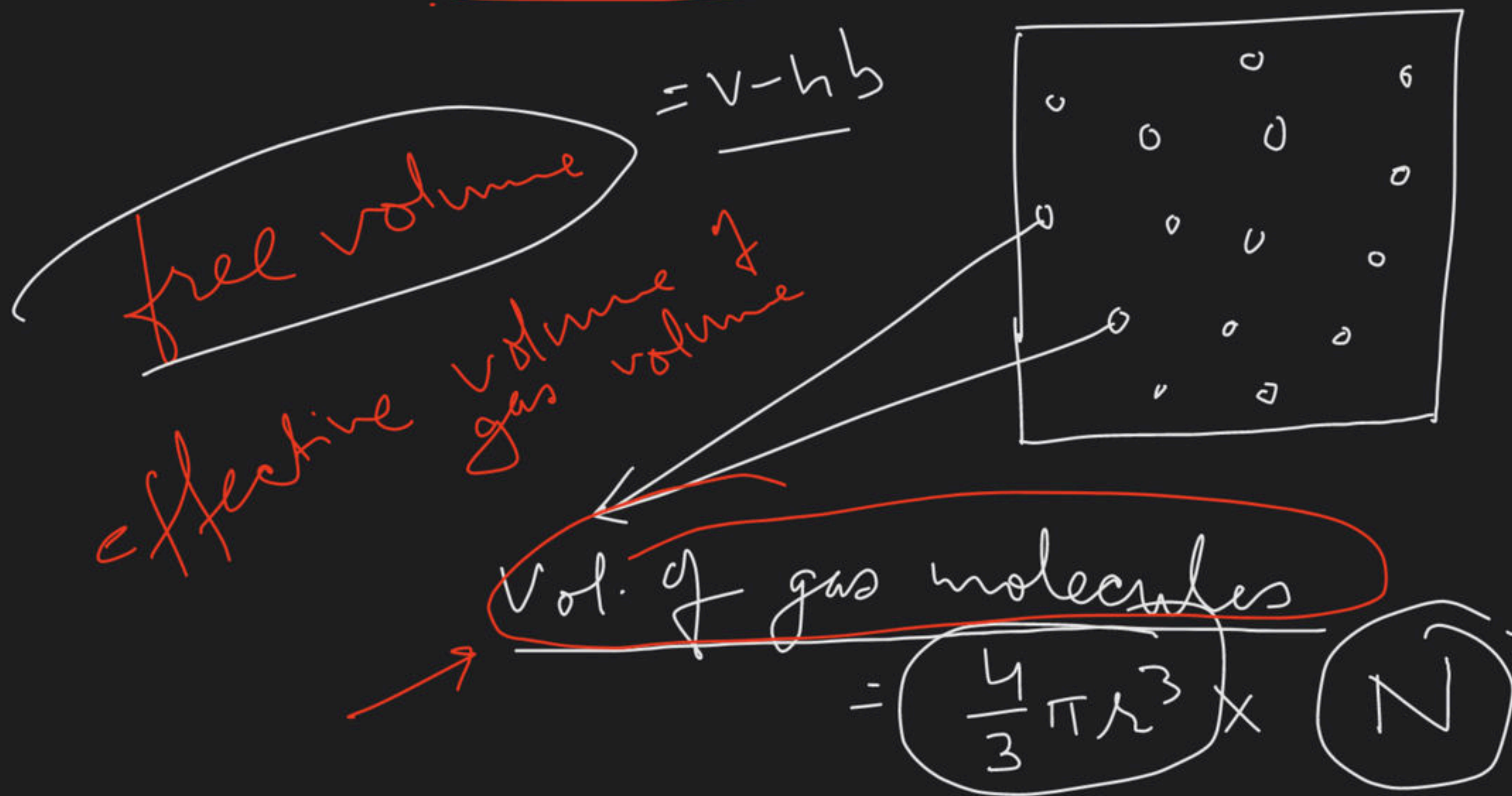
to compensate the error caused by
above two assumptions Vander Waal
introduced following two corrections
in $PV = nRT$ eq.

① Volume Correction

② Pressure Correction

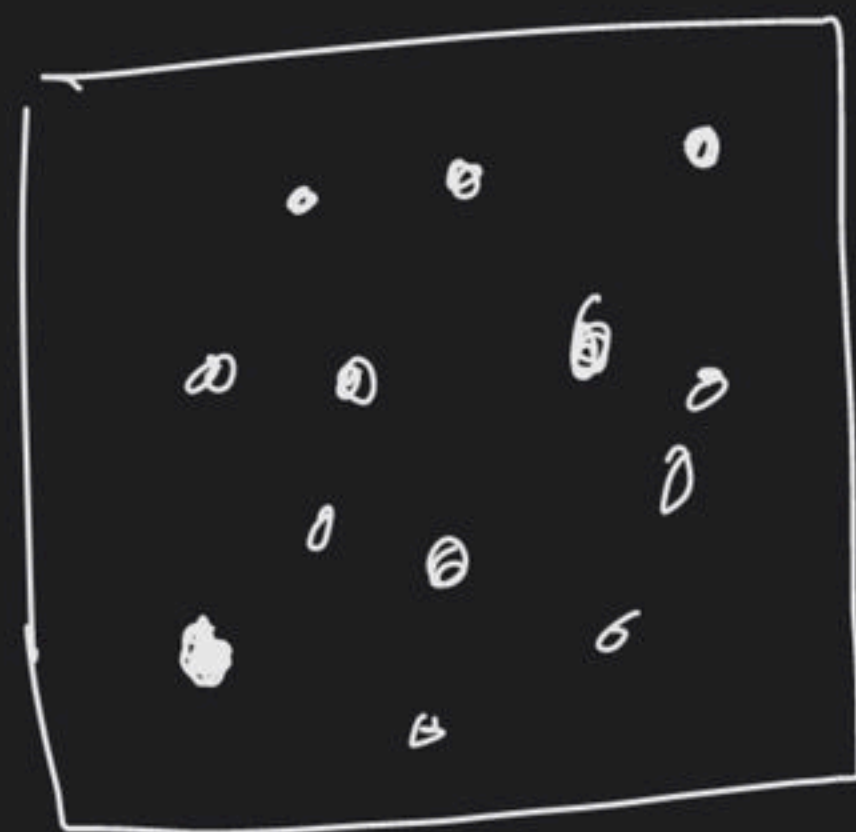
① Volume correction : \rightarrow

$$\Rightarrow V_{\text{gas}} = V_{\text{cont}} = V_{\text{occupied by gas}} = \underline{V_{\text{observed}}}$$



$$PV = nRT$$

↑
free volume



$\hat{=}$ Vol in which molecule
 can move

$= V -$ vol of ^{effective} gas molecules

$$= \underline{\underline{V - nb}}$$

$$\underline{\underline{P(V - nb) = nRT}}$$

but impenetrable spheres. The volume occupied by the molecules also becomes significant because instead of moving in volume V , these are now restricted to volume $(V-nb)$ where nb is approximately the total volume occupied by the molecules themselves. Here, b is a constant. Having taken into account the corrections for pressure and volume, we can rewrite equation (5.17) as



effective
vol. of
1 mol
molecule

$$= \left(\frac{4}{3} \pi r^3 \times N_A \right)$$

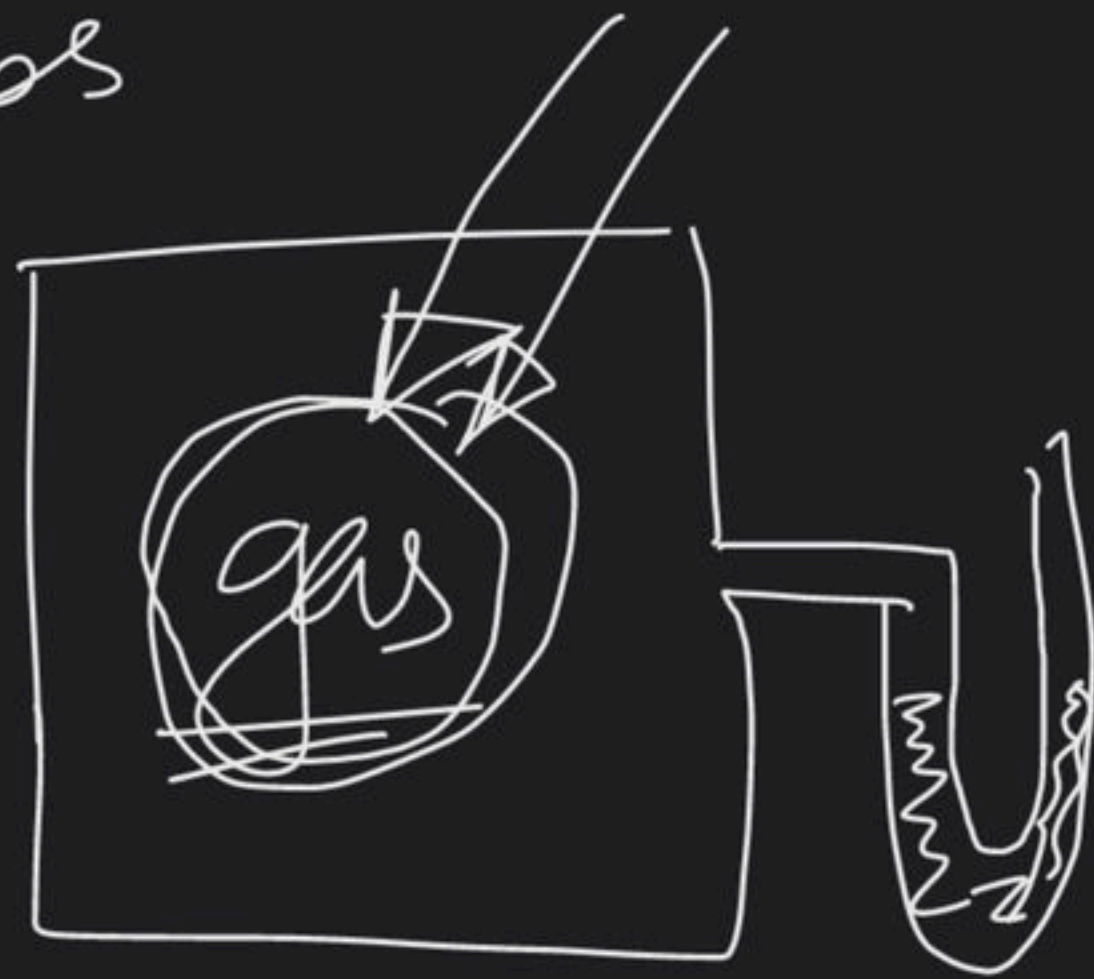
$$= \underline{b} =$$

Vander Waals
const.

Pressure Correction : \rightarrow

$$P_{\text{gas}} = \underline{P_{\text{exerted}}} = P_{\text{obs}}$$

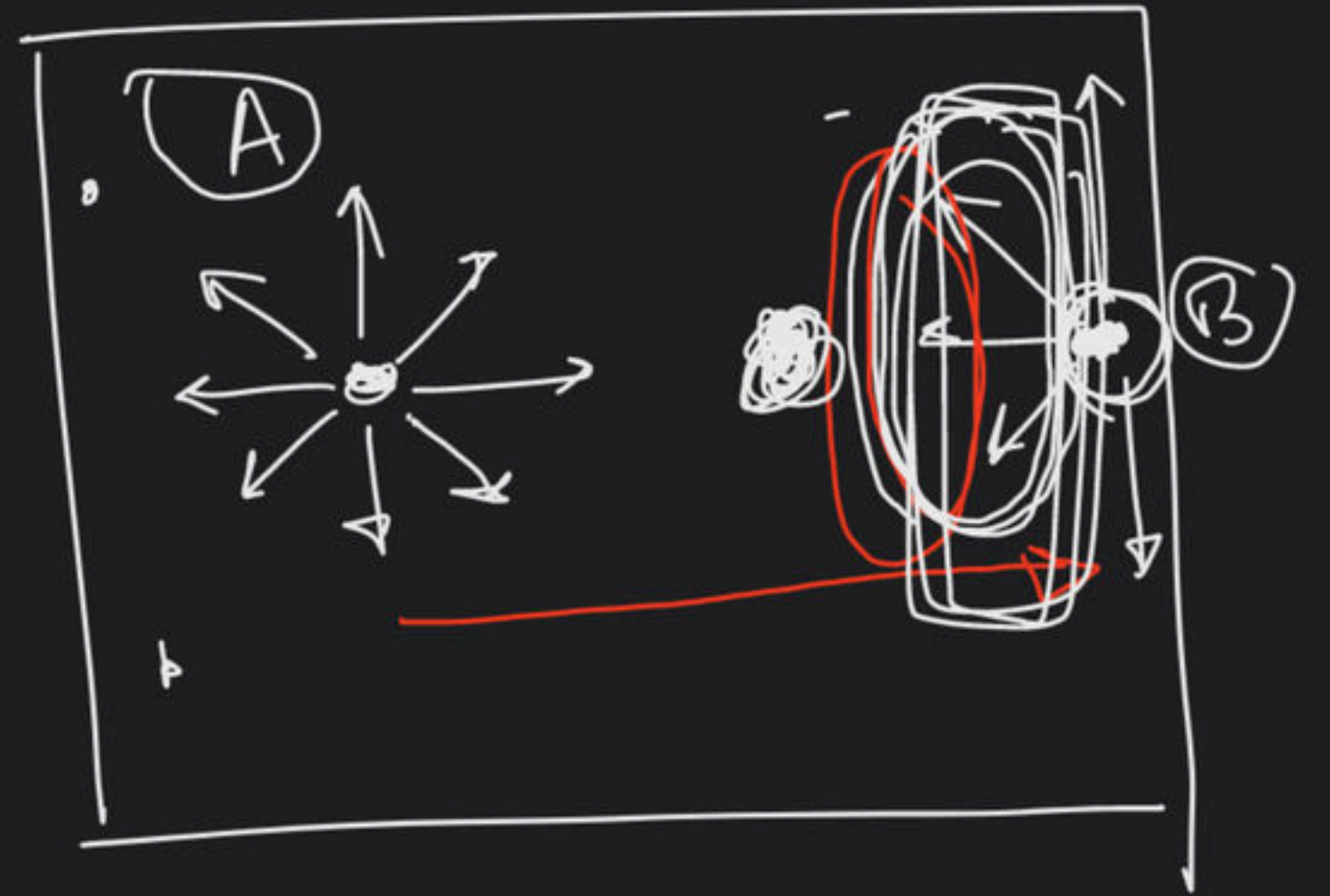
$$\underset{\uparrow}{P}V = nRT$$



Pressure exerted by
the gas when there is
no attraction betⁿ molecules

$$P = P_{obs} + P_{corr}$$

$$= P_{obs} + \left(\frac{an^2}{V^2} \right)$$



$\left(\frac{n}{V} \right) \propto$ no. of molecules pulling back a molecule

$\left(\frac{n}{V} \right) \propto$ no. of molecules being pulled back in one sec.

$\rightarrow (a) \propto$ attraction betⁿ molecules

$$P' V' = nRT$$

a & b Vanderwaals
const

\uparrow \nwarrow $V - nb$

$$P + \frac{an^2}{V^2}$$

$$\left(P + \frac{an^2}{V^2} \right) (V - nb) = nRT$$

$$PV = nRT$$

(A)

✓

$$P'V' = nRT$$

(B)

$$\underline{V - nb}$$

$$\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$$

~~A~~

Real gas

→ 5th cont

