

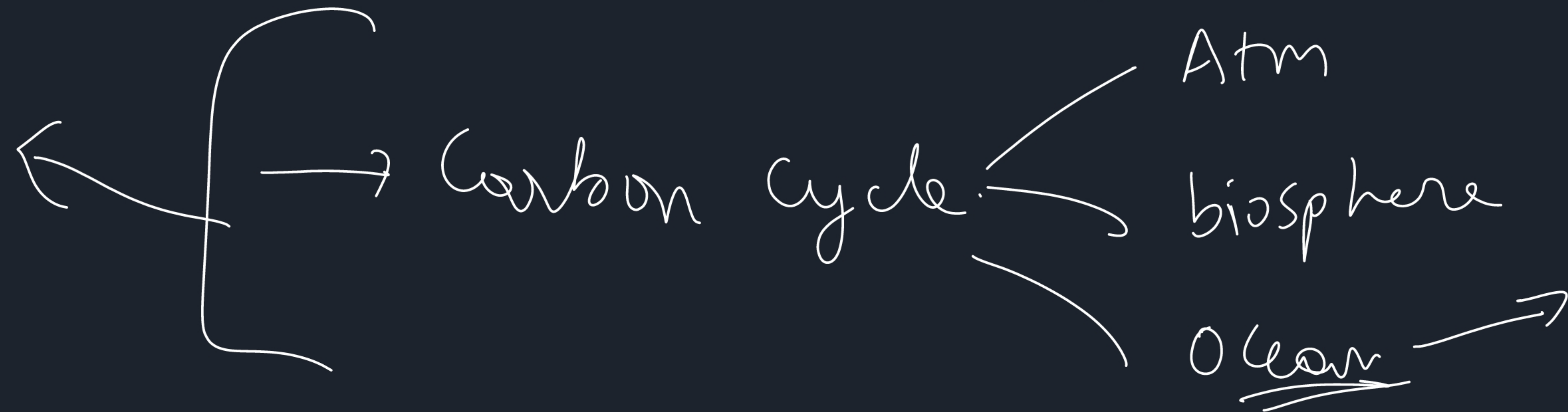
Brief Introduction to Earth's Atm.

→ Mass of the atm air.

→ Chemical Composition of atm air

→ Vertical structure of atm

[Pressure, temperature, density].



Carbon Sequestration
"Removal of carbon from atm"

Climate change

→ Mass of the atm air.

(1) Weight of unit Vol of air.

$$F = \rho g \quad \text{--- (1)}$$

$$P_s = \int_0^{\infty} \rho g \, dz. \quad \text{unit wt.}$$

$$\int_0^{\infty} \rho \, dz = \underline{\underline{M}}$$

$$\underline{\underline{P_s = Mg.}}$$

#1 If the globally avg Surface Pressure
is $9.85 \times 10^4 \text{ Pa}$ & radius of the

Earth is $6.37 \times 10^6 \text{ m}$
 $1 \text{ Pa} = 1 \text{ kg} / \text{m s}^2$

Estimate the mass of the atm air.

$$P_s = Mg$$

$$M = \int_0^\infty \rho g \cdot z$$

$$\underline{\underline{1.004 \times 10^4 \text{ kg/m}^2}}$$

$$1.004 \times 10^4 \times 4 \pi R^2$$

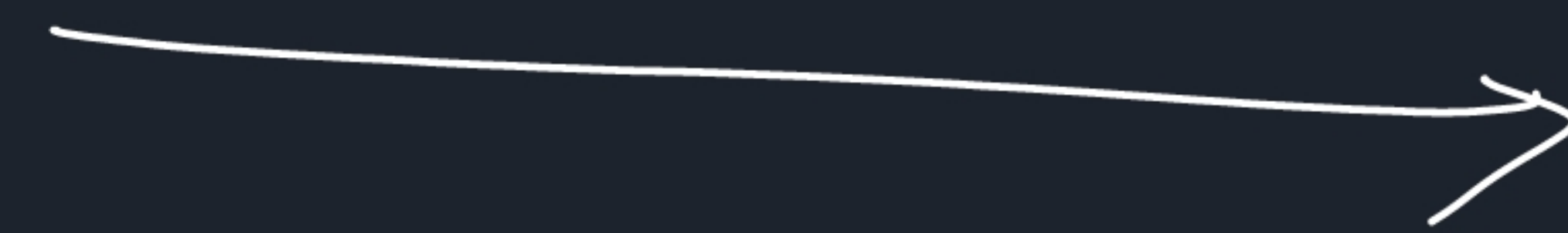
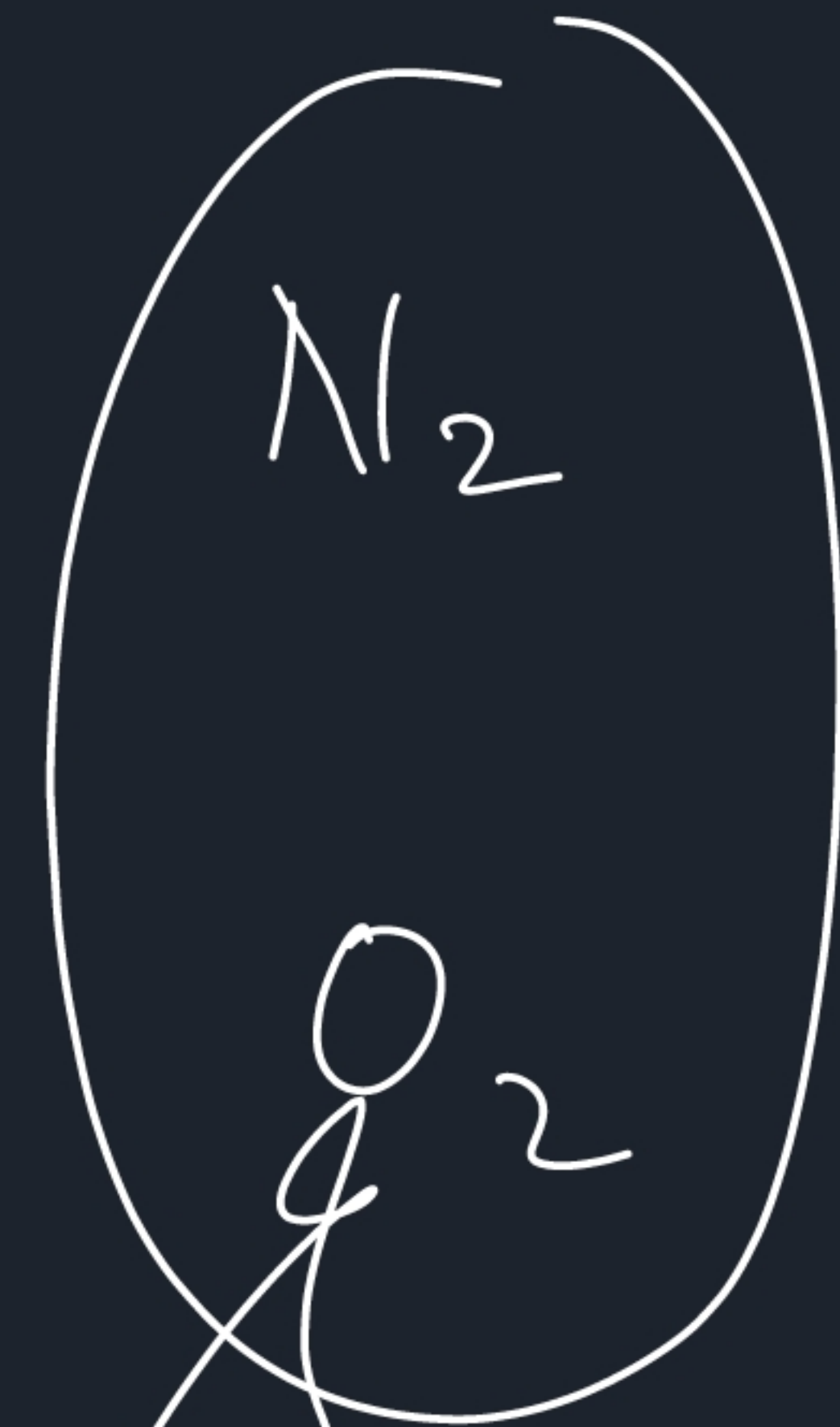
$$= \boxed{5.12 \times 10^{18} \text{ kg}}$$

Chemical Composition of Atm air.

Vol Conc (v/v)

Constituent

Mol wt
(g/mol)



28



78.1



32



20.9

Ar



40



0.9



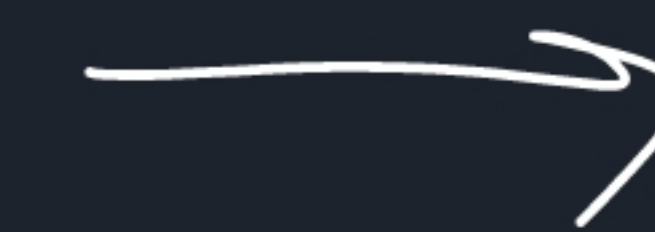
44



380 ppm



16



1.75 ppm

#2

Based on the Chemical Composition table,

Estimate the Mol Wt. of atm air.

$$= \left(0.781 \times \overset{\checkmark}{28} \right) + (0.201 \times 32) + (40 \times 0.009)$$

$$= \underline{\underline{28.92}} \text{ g/mol.}$$

Convert the Volumetric analysis of the chemical
Composition \longrightarrow gravimetric (in terms of mass)

$$\underline{\underline{N_2}} = \frac{28 \times 78.1}{28.92} = 75.6\%$$

$$O_2 = 23.12\%$$

$$Ar = 1.24\%$$

atm air.

$$P = P_0 (0.36)$$

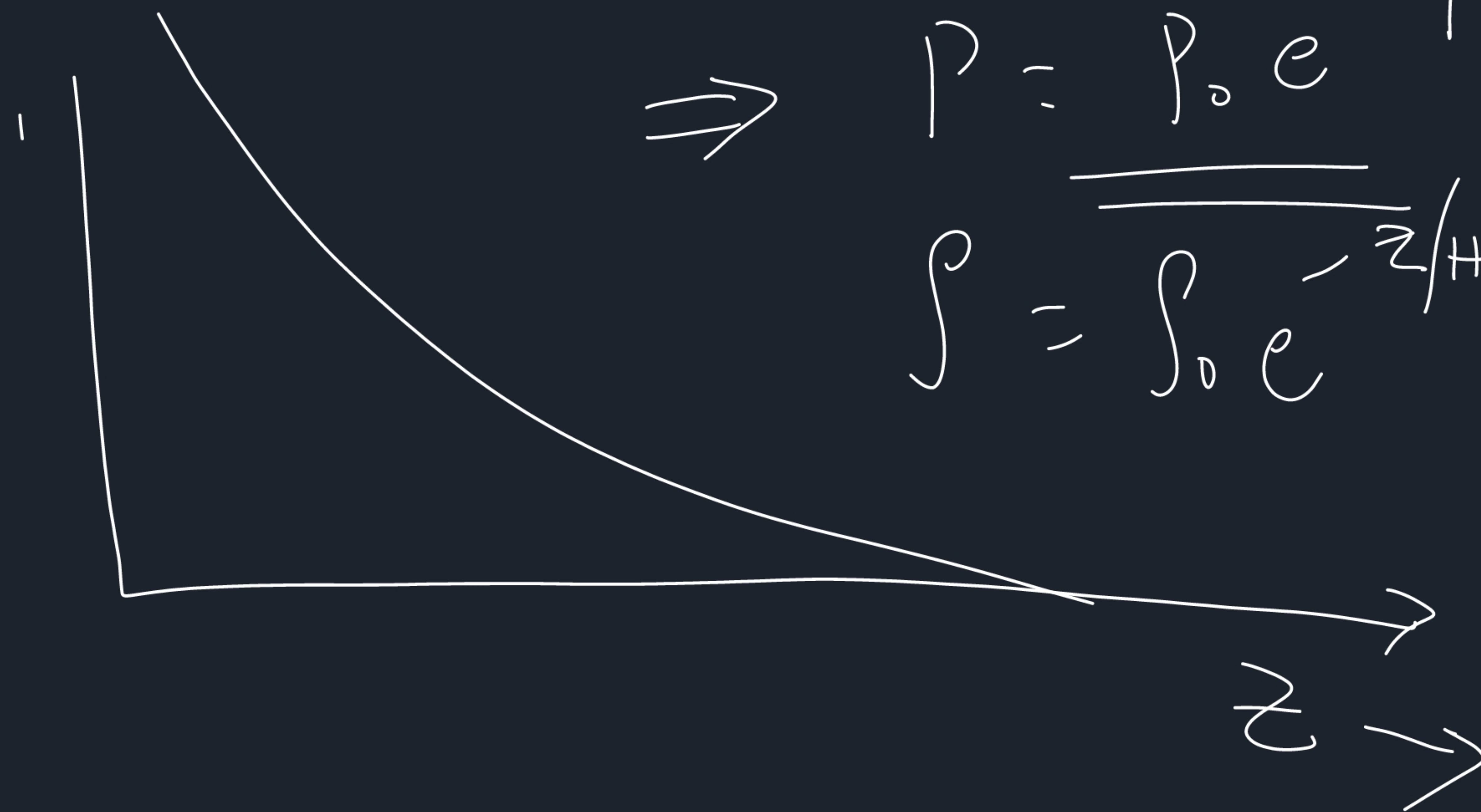
$$\frac{P}{P_0} = \frac{1}{e}$$

$$z = H$$

Scale
height.

$$\Rightarrow P = P_0 e^{-z/H}$$

$$P = P_0 e^{-z/H} \quad C - \text{folding depth.}$$



Roborumble

workshops →

11, 12, 13, 14

7:00 - 9:00 pm