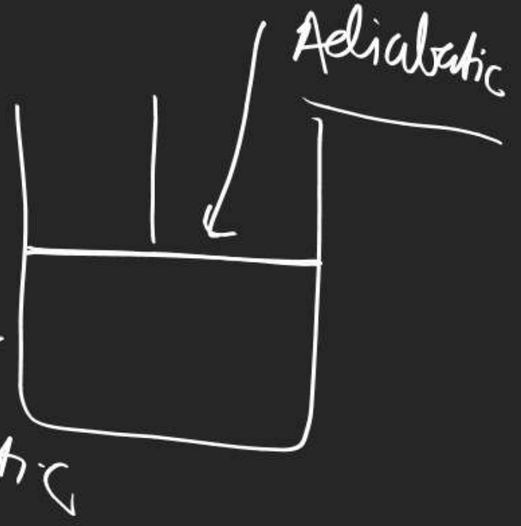
Depending upon the type of boundaries system can be categorised into

(1) Isolated system :- Neither energy nor matter can be transferred b/w system and surrounding

boundaries must be

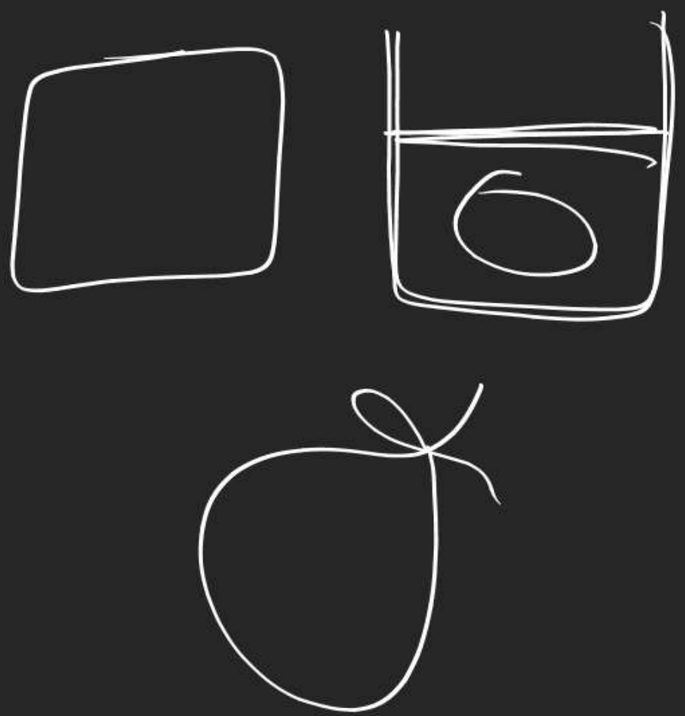
(1) Adiabatic → No heat transfer
(2) Rigid — No work
(3) Impermeable → NO matter

eg thermos flask, Universe



② Closed System :— Energy can transfer but not matter.

Boundaries must be impermeable



Q. A closed system means volume is constant

False

True / False

(3) Open system :→ which can transfer matter

Boundaries → permeable

called intensive property.

k
e
es
e system

Intensive

Temperature
Pressure
Density
Molar mass
b.pt, m.pt
Molarity
(Conc. terms)

pH, Vap pr

Viscosity, refractive index

Extensive

Volume
moles
mass
Energy

[
Enthalpy
Entropy
Gibb's energy

molar mass = mass/mol

density = mass/lit

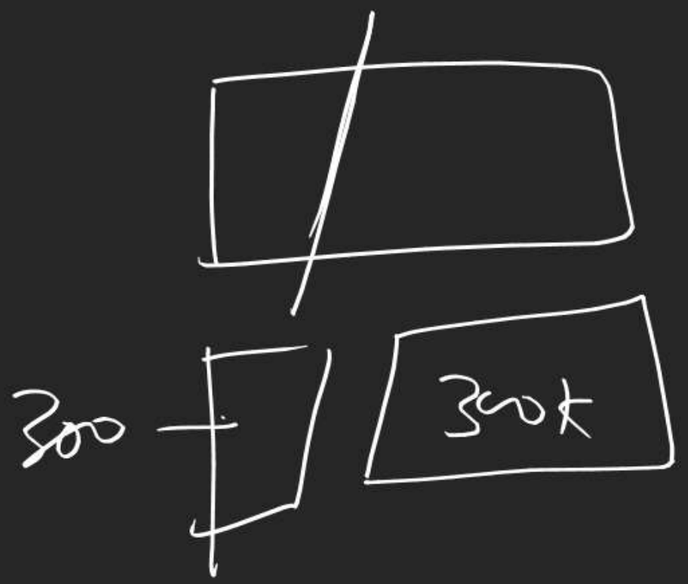
molarity = moles/lit

① An extensive property can be converted into intensive one by defining it as per mol, per gm, per lit etc

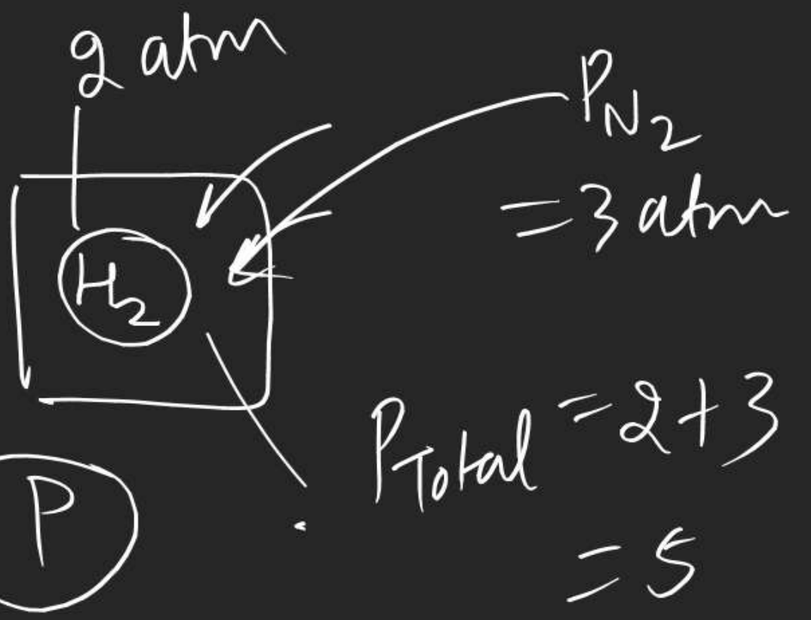
② Ratio of two extensive property becomes an intensive property.

$$\text{Intensive} = \frac{E_1/w}{E_2/w}$$

(III) Intensive properties are mass independent



(mass is change by division of the system only)



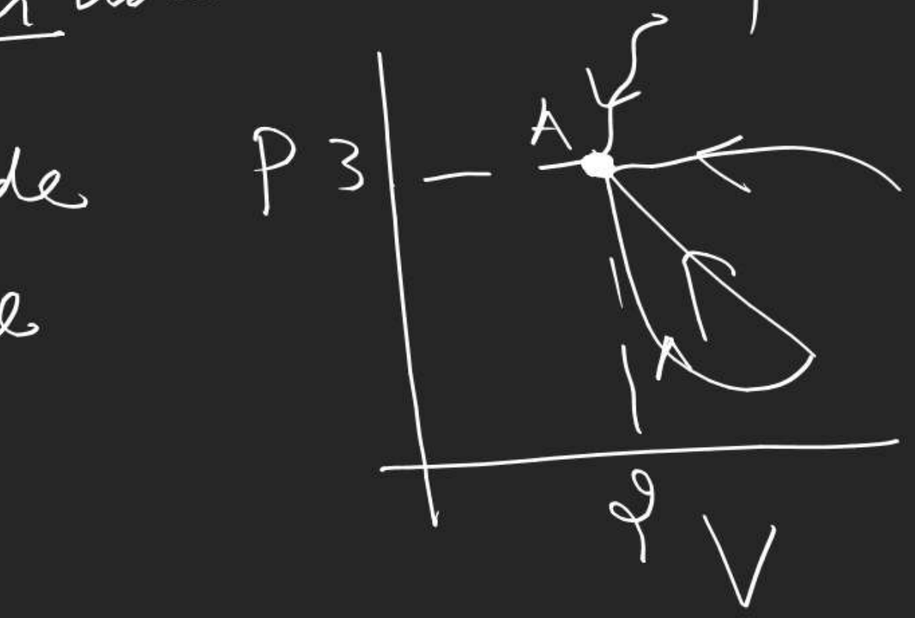
(IV) Extensive properties are additive in nature

Nishant Jindal

State function / path function / Change in state function:-

function or variable whose value depends only on final state (present state) and is independent of initial state as well as path used to achieve final state.

e.g Latitude
Longitude



P, V, T are state function

Nishant Jindal

Latitude ⟶ final

T → state function

Change in Latitude → Initial & final

ΔT ← Change in state function

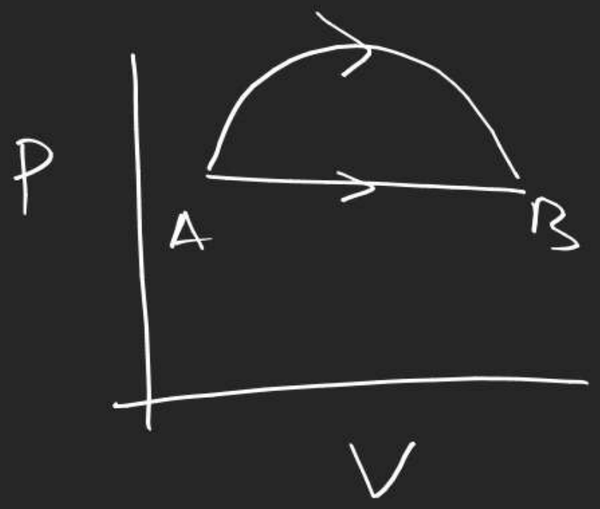
State function — depends only on final state — path in dependent

Change in state function — depends on Initial & final state — path indepn

path function :— which depends on path

e.g. Heat

Work

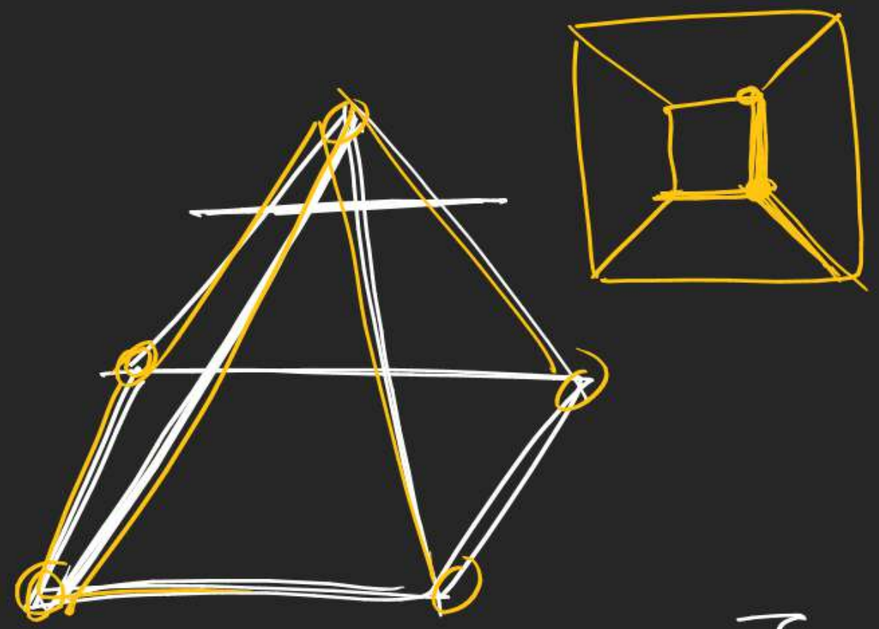


Nishant Jindal

M	X
□	○
$1+\frac{1}{4}\times 4$	4
$1+1=2$	4

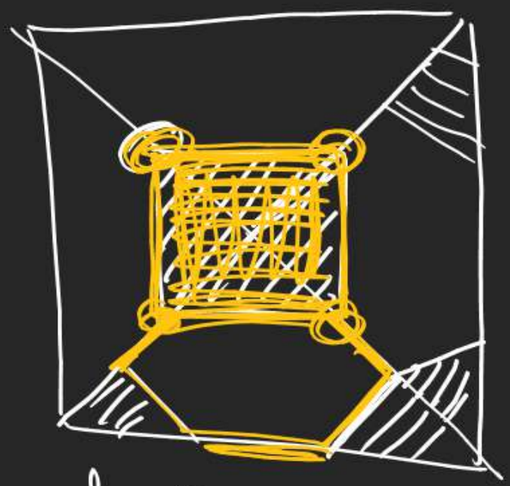
$$MX_2$$

Nishant Jindal



Octahedron

corner → 6
faces → 8 (triangular)
edges — 12 edge

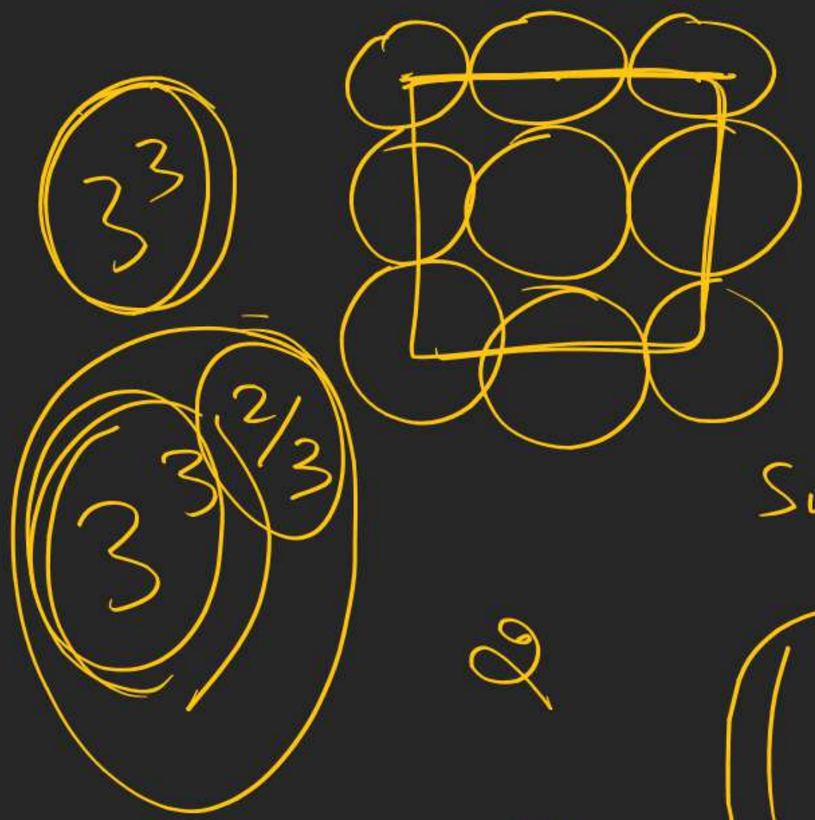


Truncated octahedron

Square face — 6
Hexagonal faces → 8
Corners → 24
edges → 36

Nishant Jindal

3 atoms



Surface area $= 10^{-12}$

$a = 10^{-6}$ m

Volume $= 10^{-18}$ m^3

mass of Ag $= 10^{-18} \times 10.5 \times 10^{6}$ gm

no. of atoms of Ag $= \frac{10^{-12} \times 10.5 \times N_A}{108}$

Surface $\propto \left(\frac{10^{-12} \times 10.5 \times N_A}{108}\right)^{2/3}$

$\propto$