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Thermodynamics

work

energy
- KE
- PE

Heat
- Conduction
- Convection
- Radiation → light (EM waves)

T = Const
- exo: PE ↓, $\Delta KE = 0$
- endo: PE ↑, $\Delta KE = 0$

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Work → PV (Pressure Volume work)

Work → non-PV

e.g electric work
gravitational work

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the

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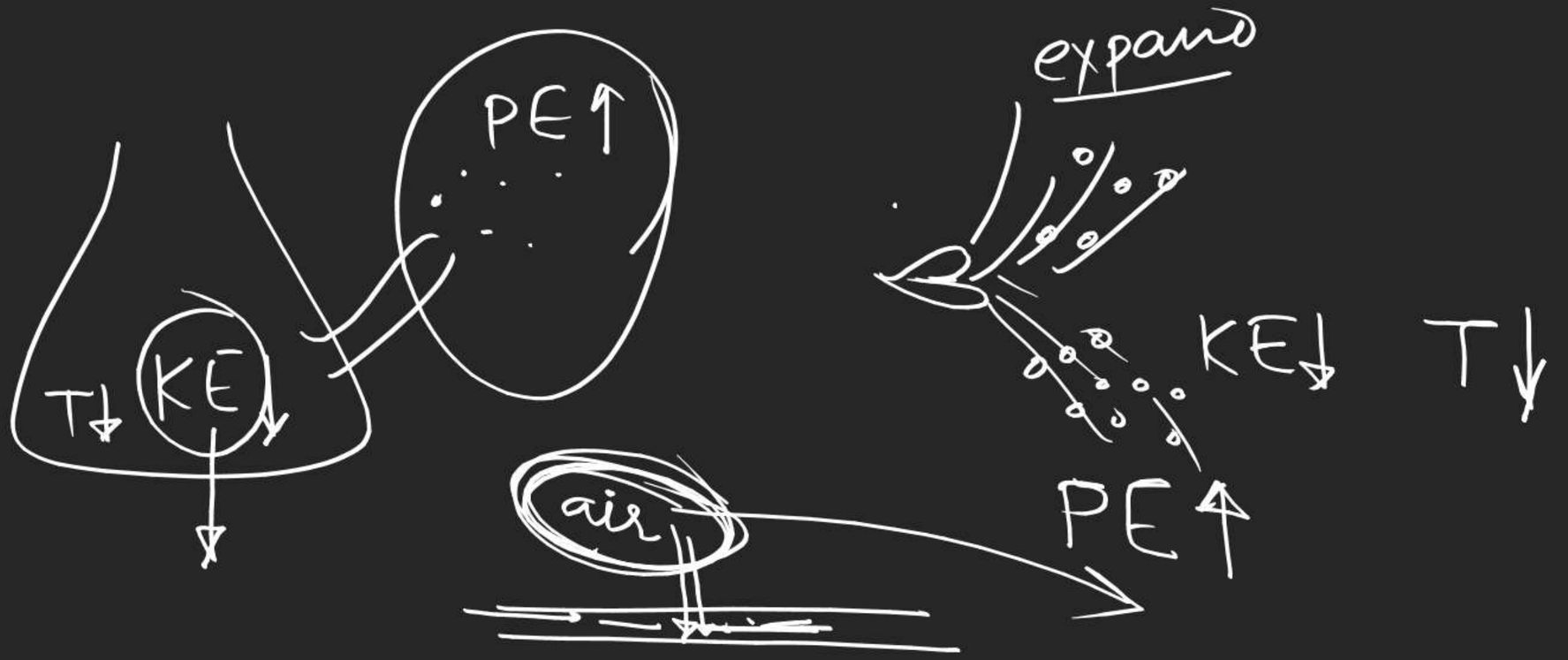

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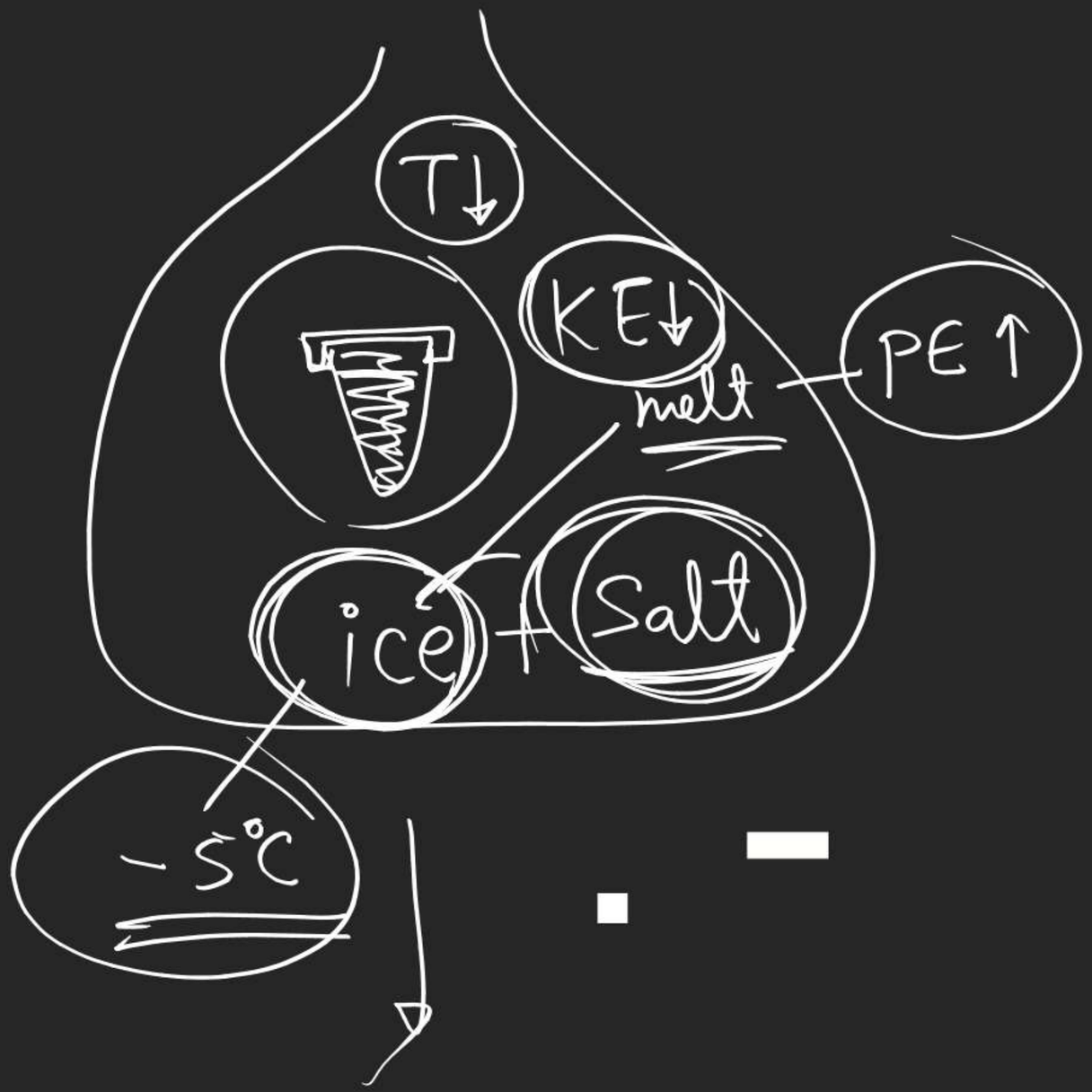

-5°C 1 hr

-15°C 40min

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KE of substance/system depends only on temperature

$$KE = f(T)$$

$H_2O(\ell)$ $H_2O(g)$

$100^\circ C$ $100^\circ C$

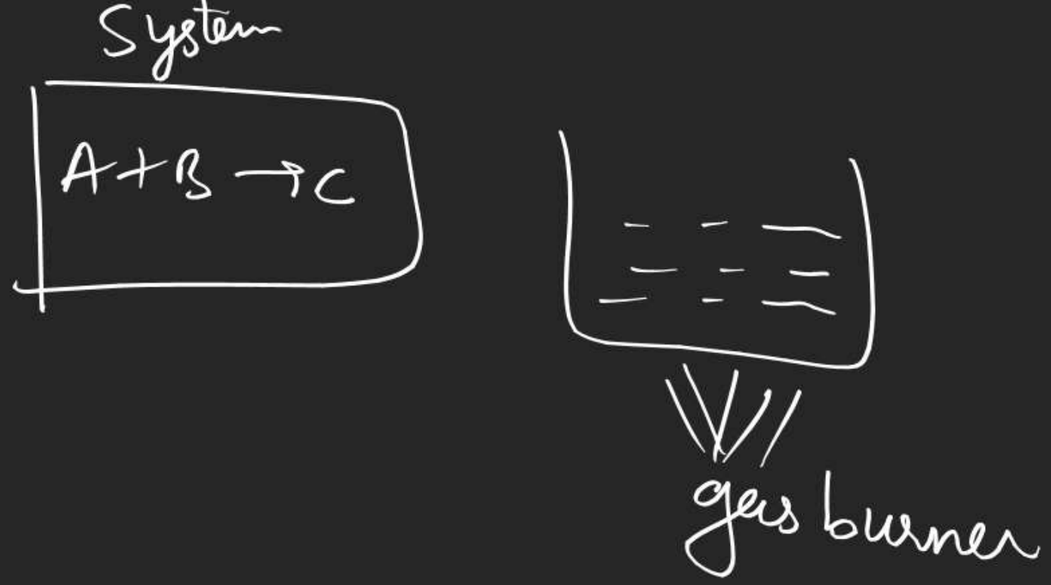
$KE = KE$

$PT < PE$

Total Energy < Total Energy

Some Basic Definitions :→

① System :→ Any macroscopic part of the universe under observation is called system.



macroscopic

microscopic

(2) **Surroundings**:- Remaining part of the universe which can interact with system is called surroundings.

Note: Change in properties of surroundings shall be considered very small due to its large size.

③ Boundary :— Anything which separates a system from its surroundings.

permeable | impermeable

Boundaries may be

real or imaginary

Adiabatic (No heat transfer)

diathermic (heat can transfer)

Rigid (non-movable)

Non-rigid (Movable)

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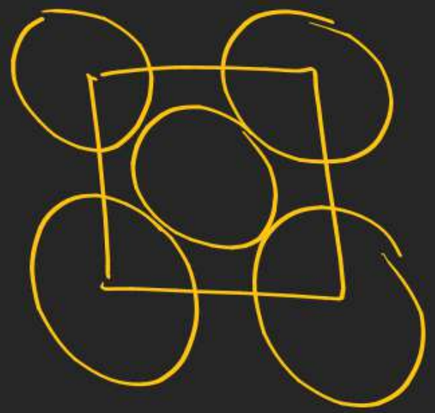
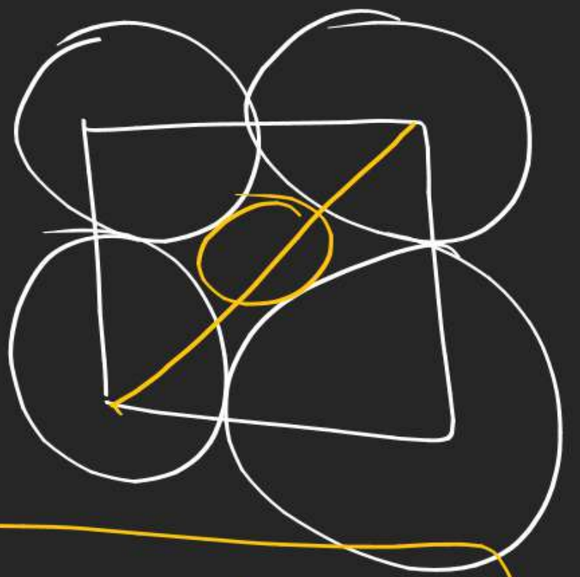
X	Y
$\frac{1}{2}\times 6$	$\frac{1}{8}\times 8$
3	1



$$P.F = \frac{\frac{4}{3}\pi\left(1r_y^3 + 3r_x^3\right)}{a^3}$$

$$a = 2r_y$$

$$\frac{r_x}{r_y} = 0.414$$



$$\sqrt{2}a = 2r_x + 2r_y$$

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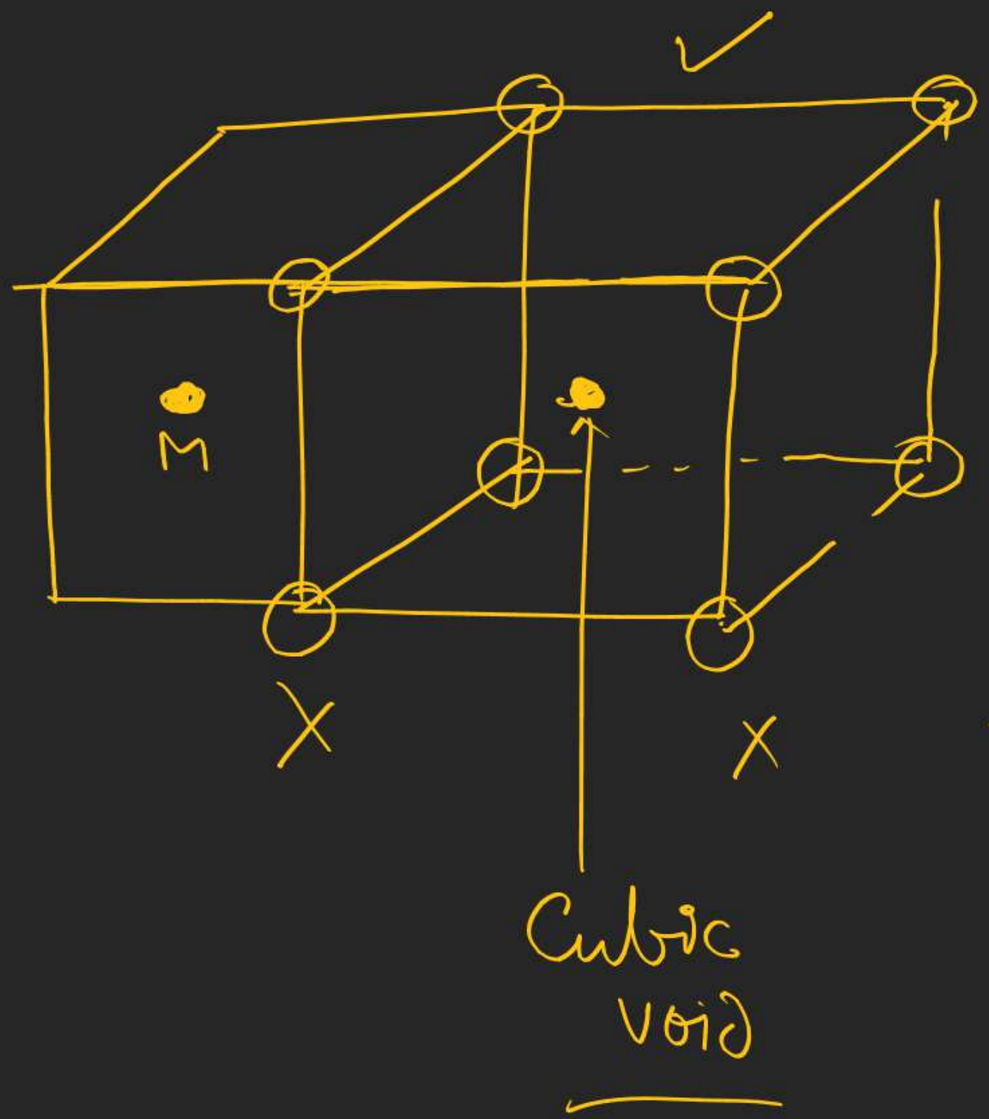
(3)



MX

$$\frac{r_+}{r_-} = 0.732$$

$$\frac{\sqrt{3}a}{2} = \frac{BL}{q}$$

$$\frac{1.732}{2} = \frac{BL}{q}$$

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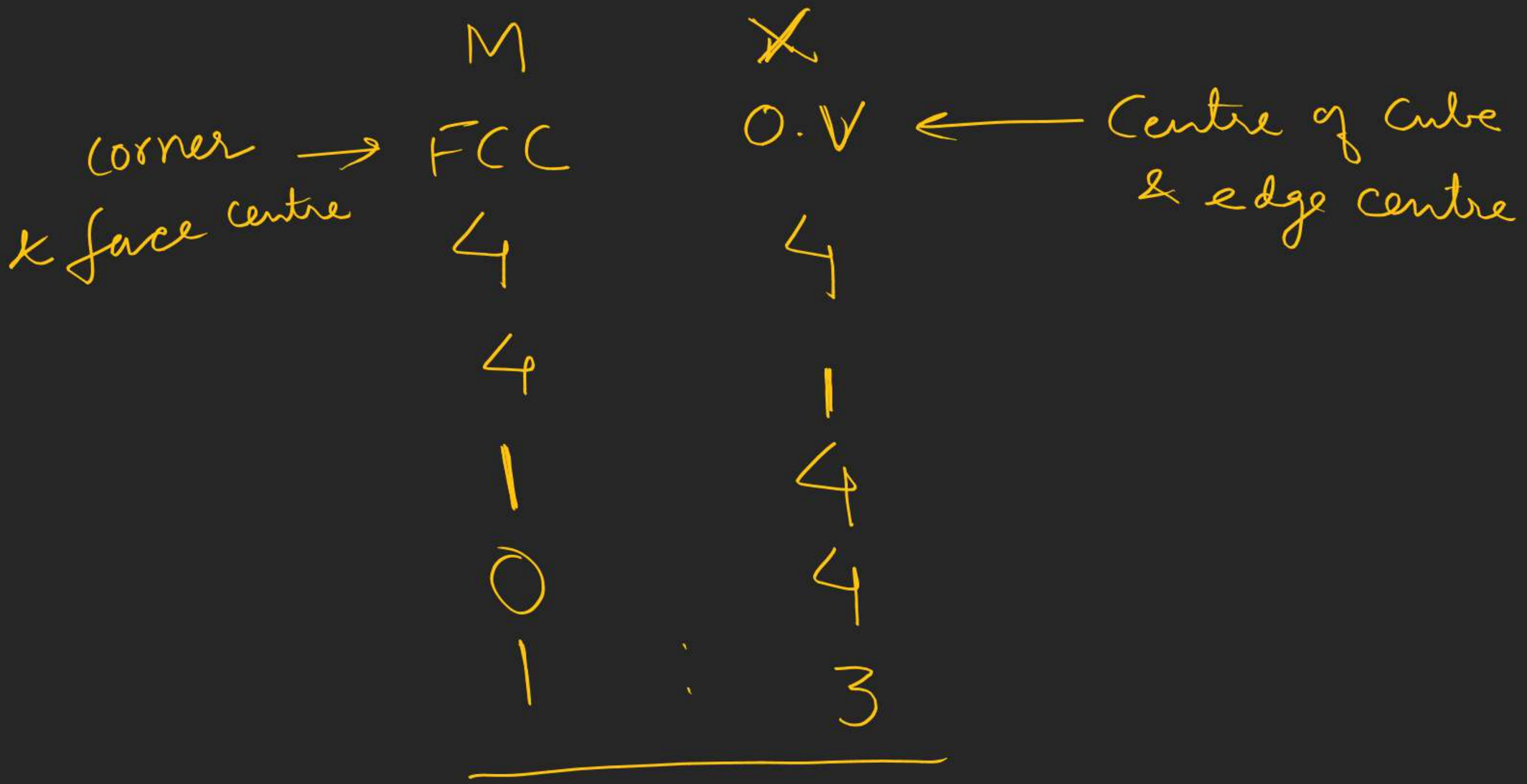

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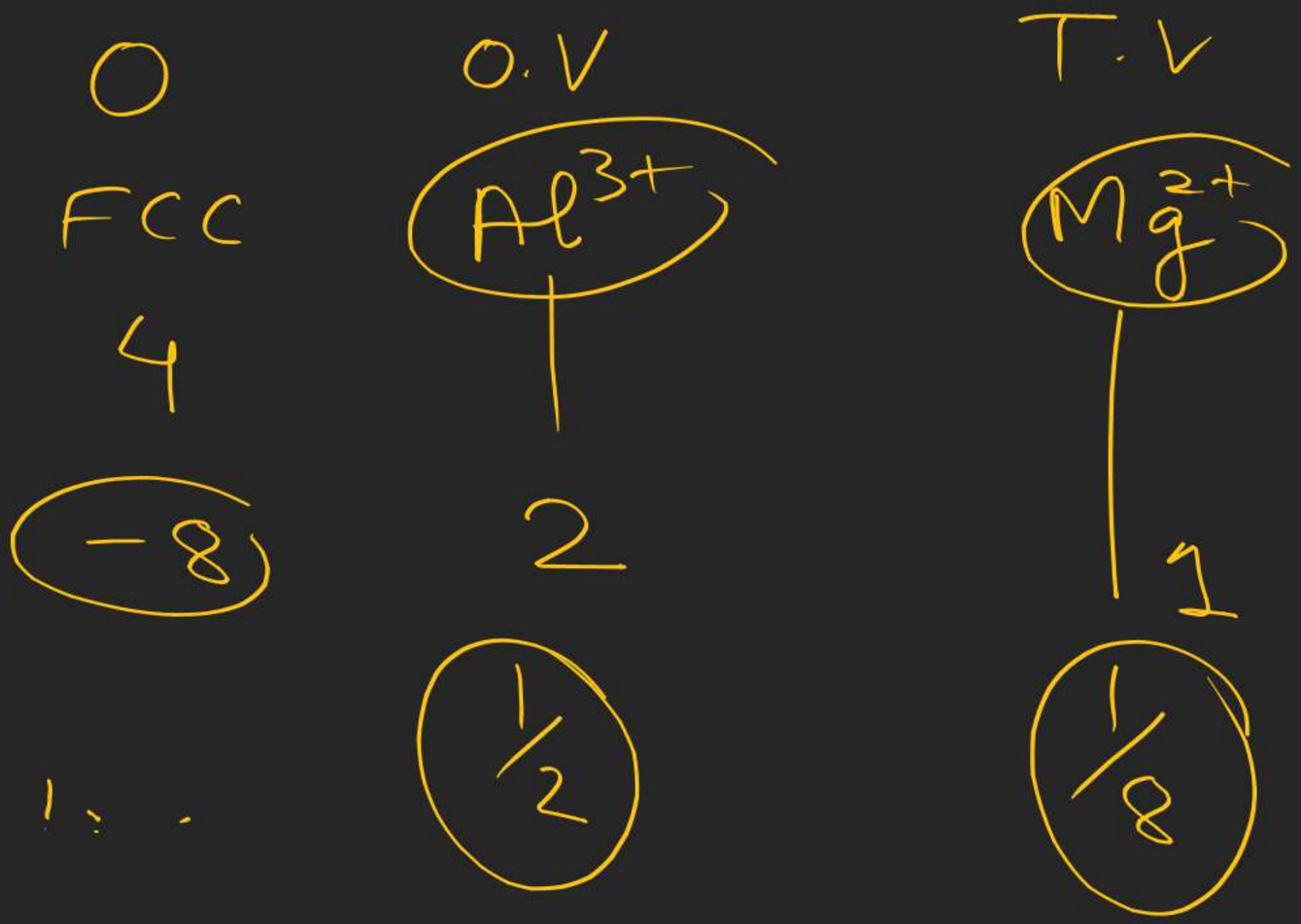

$$8 = \frac{4 \times M/N_A}{(400 \times 10^{-10})^3}$$