

(1) Light \rightarrow Part of EM spectrum \rightarrow help us to see obj.
 $\hookrightarrow \lambda \rightarrow$ (380nm \rightarrow 760nm)

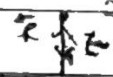
(2) Optics

\rightarrow Ray optics \rightarrow Dimension obj. \rightarrow much bigger λ of light
 \rightarrow wave optics \rightarrow " " \rightarrow comparable " "
 (Interference, diffraction, polarization)

(3) Reflection $\rightarrow \angle i = \angle r$ (Always)

\rightarrow Normal pass thru centre of sphere (case of spherical polished surface)

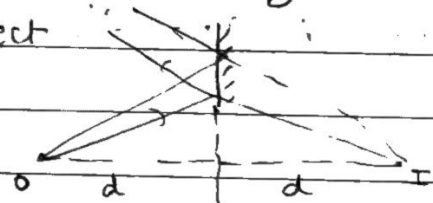
(4) Normal incidence $\rightarrow \angle i = \angle r = 0$



(5) Image formation by Plane mirror \rightarrow 'Virtual Image' (erect/upright)

(a) Pt object

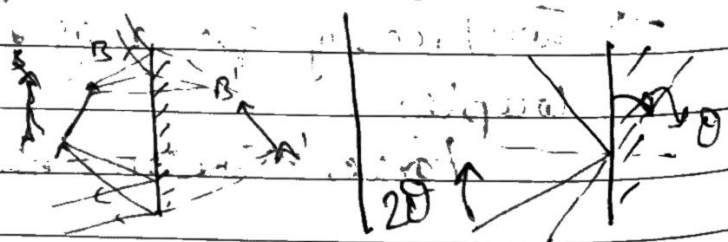
cup



Distance should be \perp from mirror

Distance of obj = Distance of mirror

(b) Extended obj



(6) Clock problems \rightarrow H = 59 : 60 \rightarrow Given times

* Image formed when two rays 'X'

(7) Problems involving min^m length of mirror use ray diagram & similar Δ concept.

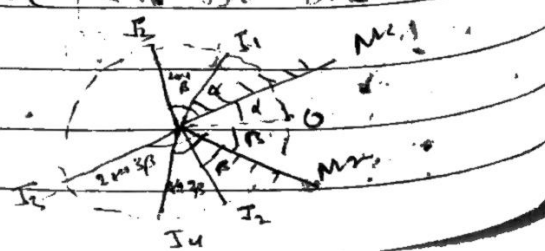
(8) no. of images when two mirrors are \parallel (at 180°) $\rightarrow \infty$

" " " " " " " " \perp (at 90°) $\rightarrow 3$

[Image of I_1, I_2 overlap at I_3]

(9) Circular Concept \hookrightarrow

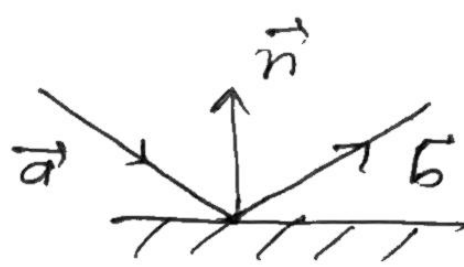
Image formed until one of image get behind a mirror



Reflected Ray γ .

\angle of incidence

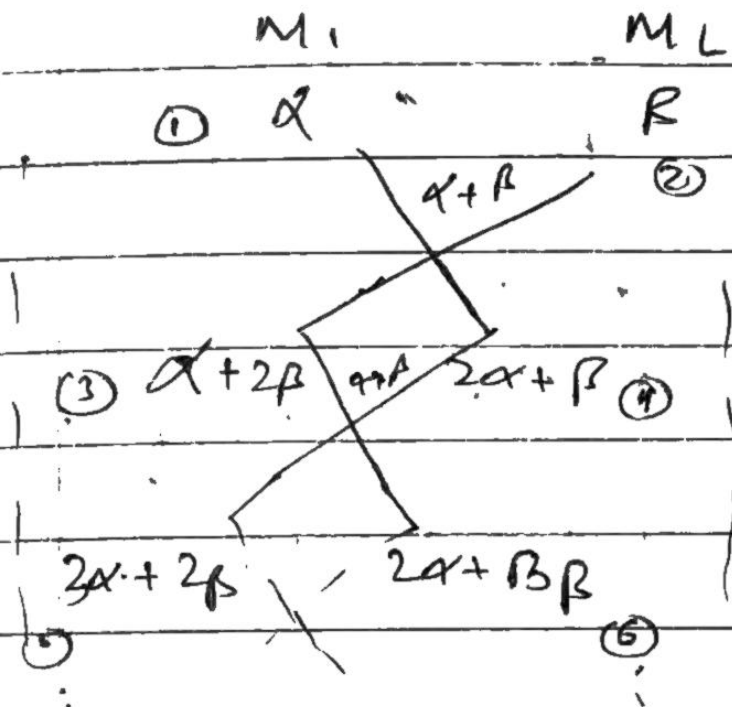
$$\theta = \theta_0 - \frac{1}{2}c + (\hat{T} \cdot \hat{R})$$



$$(\vec{a} + \vec{b}) \cdot \vec{n} = 0$$

$$(\vec{a} - \vec{b}) \times \vec{n} = 0$$

* Guis Cross method



$\alpha, \beta \rightarrow$ can be used

as distance of image from mirror

until

any of the $\angle \geq 180^\circ$

[stop]

[and don't count that image]

* If sum of any triplet = $360^\circ \Rightarrow$ an overlapping image formed

(10) shortcut $\rightarrow \theta \neq 90^\circ$ 2 plane mirror

$c \perp$ $360^\circ / \theta = n$ (n is even) obj placed symm/asymm

no. of images = $n + 1$

$c \perp$ $360^\circ / \theta = n$ (n is odd)

obj placed symm \Rightarrow no. of images = $n - 1$

asymm \Rightarrow " " = n

① ~~by~~ Huygens's wave theory of light \rightarrow

\rightarrow Light mechanical wave

Explained \rightarrow Rectilinear prop.

\rightarrow Reflection

\rightarrow Diffraction


\rightarrow Refraction


\rightarrow Interference


Failed \rightarrow Polarisation

① wavefront \rightarrow locus of all pt in a med which are vibrating in same plane

② Dir. of wave propagation \perp to wavefront

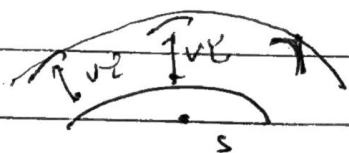
③ Pt source of light \rightarrow Spherical wavefr 

source at ∞ \rightarrow plane wavefr. 

Linear source \rightarrow Cylindrical " 

④ Every pt on wavefr. act as source of sec. disturbance which emits these own wavelets \rightarrow secondary wavelets spread in all dir with speed of wave \leftarrow

⑤ Common tangent on sec wavelets in forward dir. \rightarrow new wavefront



$t = \frac{r}{v}$ speed $\rightarrow v$

② Newton corpuscular theory

Explained \rightarrow

\rightarrow failure

\rightarrow Rectilinear prop.

\rightarrow Interference of light

\rightarrow Reflection & Refraction

\rightarrow Diffraction

\rightarrow Polarisation

\rightarrow Speed of light (water can) same time