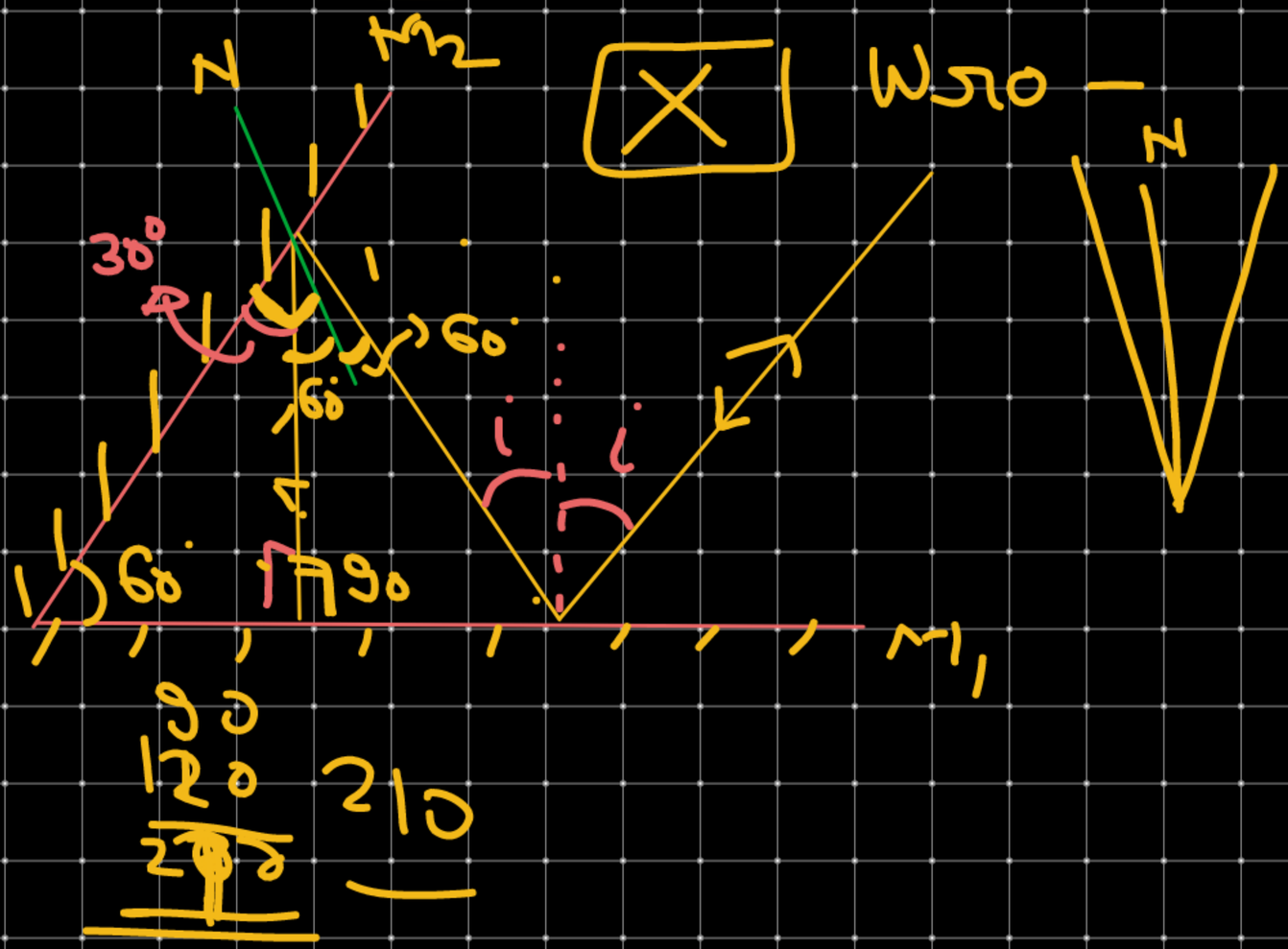
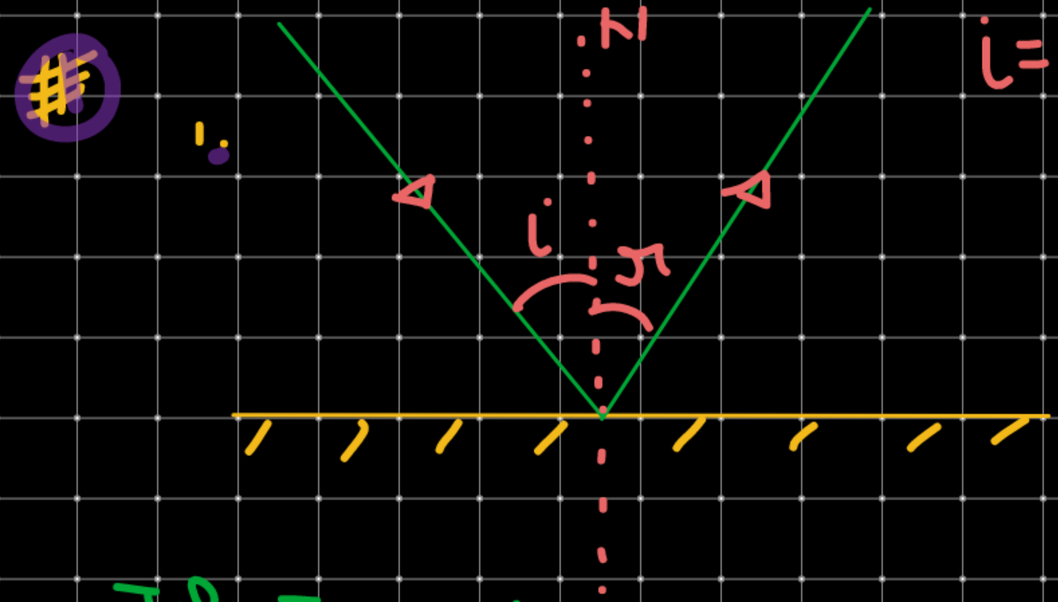
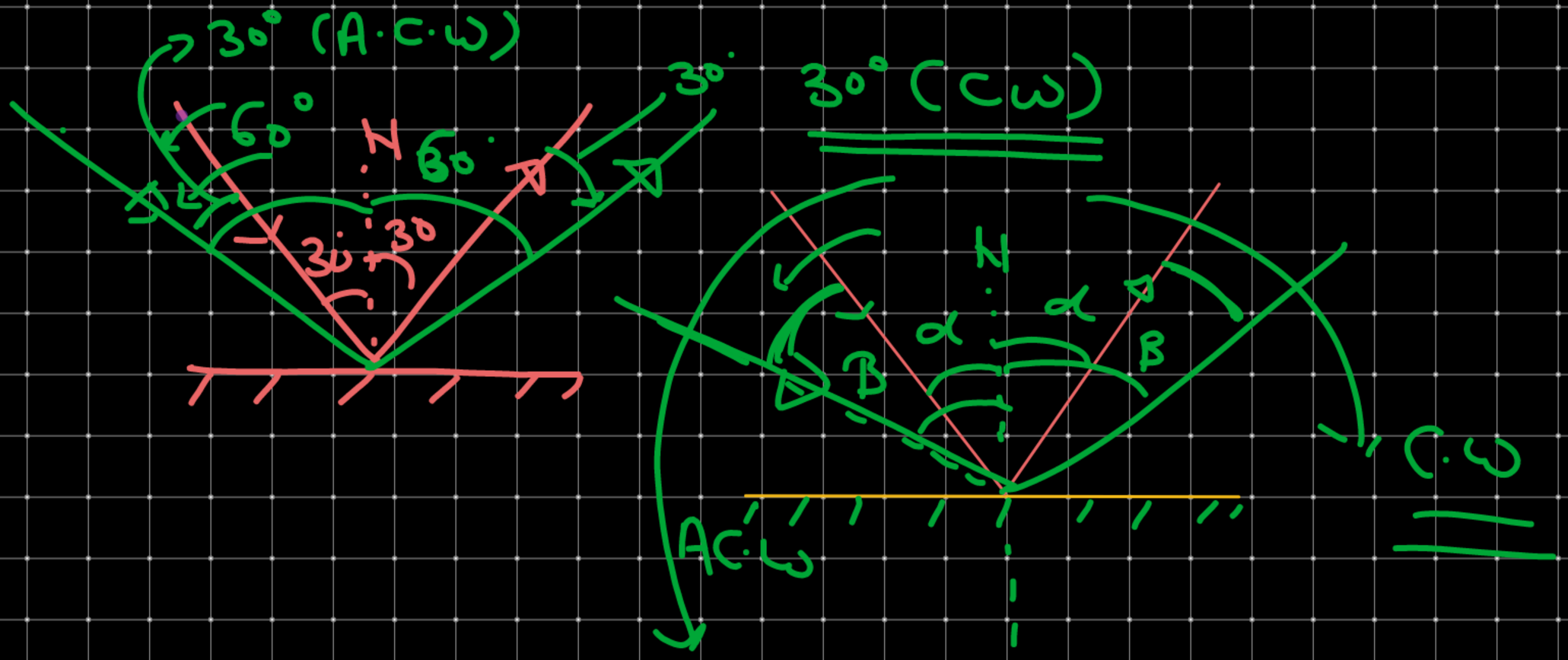
⇒ Angle of deviation:-



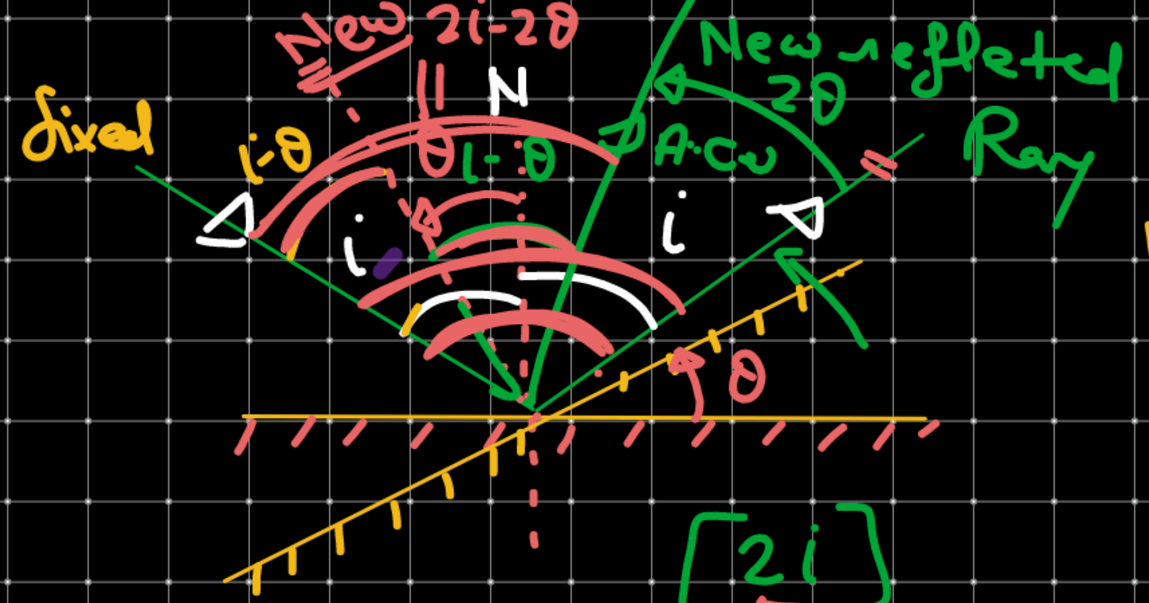


$\therefore$ $i = r$. [Rotation of incidence ray]

If incidence ray rotate at angle θ then reflected ray also rotate same angle but in opposite sense.


30° (A·C·W)
60°
N
30°
30°
30°
30°
(C W)
N
α
α
β
β
C·W
A·C·W

⇒ Rotation of mirror:**



$\theta \longrightarrow$ A C w [mirror]

→ Incidence Ray is fixed

↳ New incidence angle $= i-\theta$

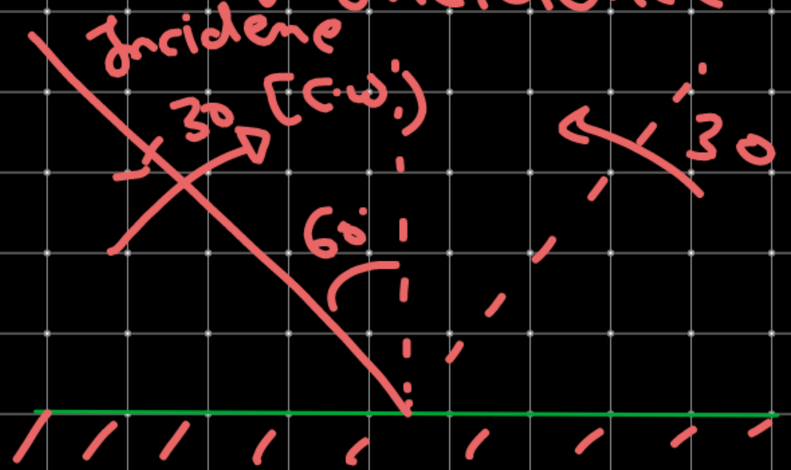
↳ New reflected angle $i-\theta$

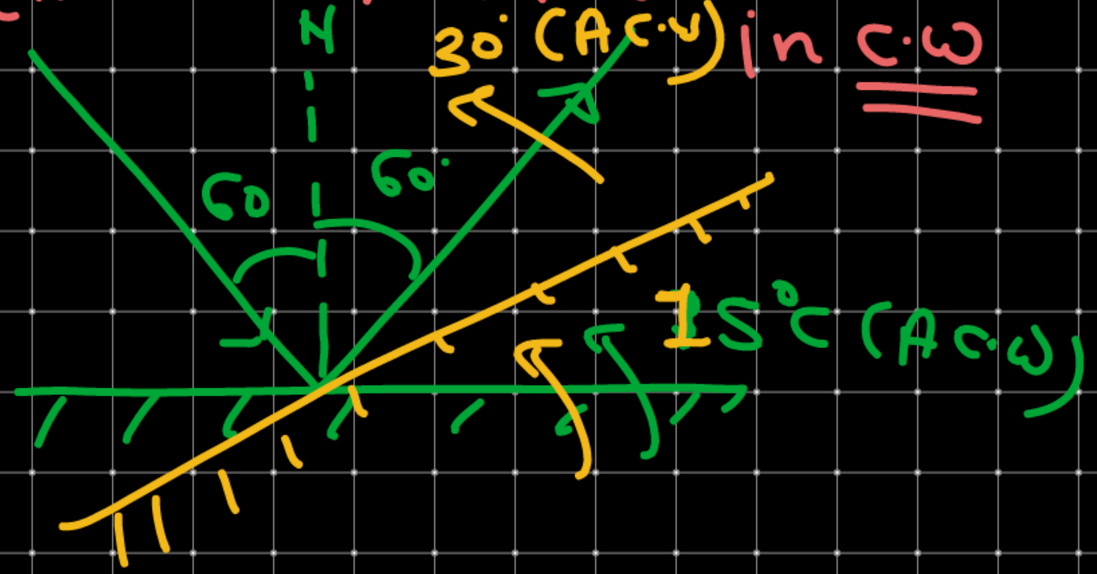
$[2i] \equiv [2i-2\theta]$ ↳ 2θ

If mirror rotate at angle θ then reflected Ray rotate 2θ angle in same sence.

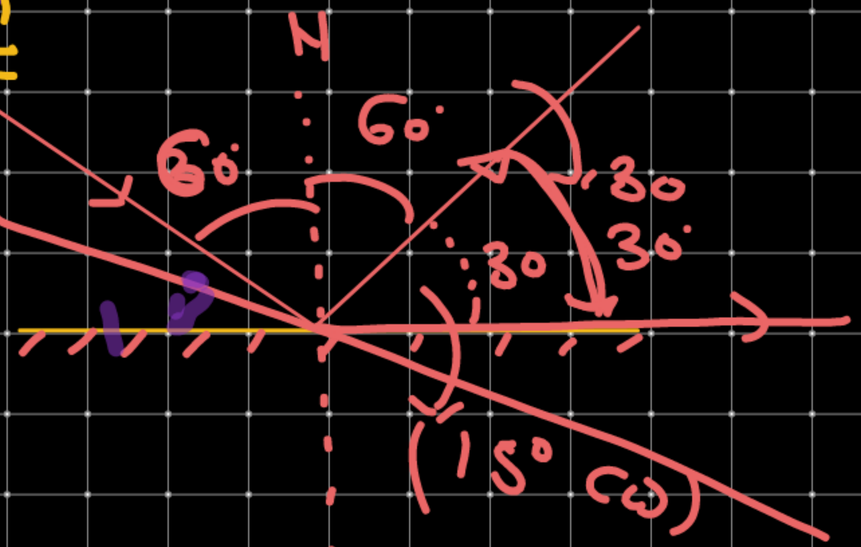
[Incidence ray is fixed]

Incidence Ray θ [ACW $\Rightarrow$ R.R Rotate θ





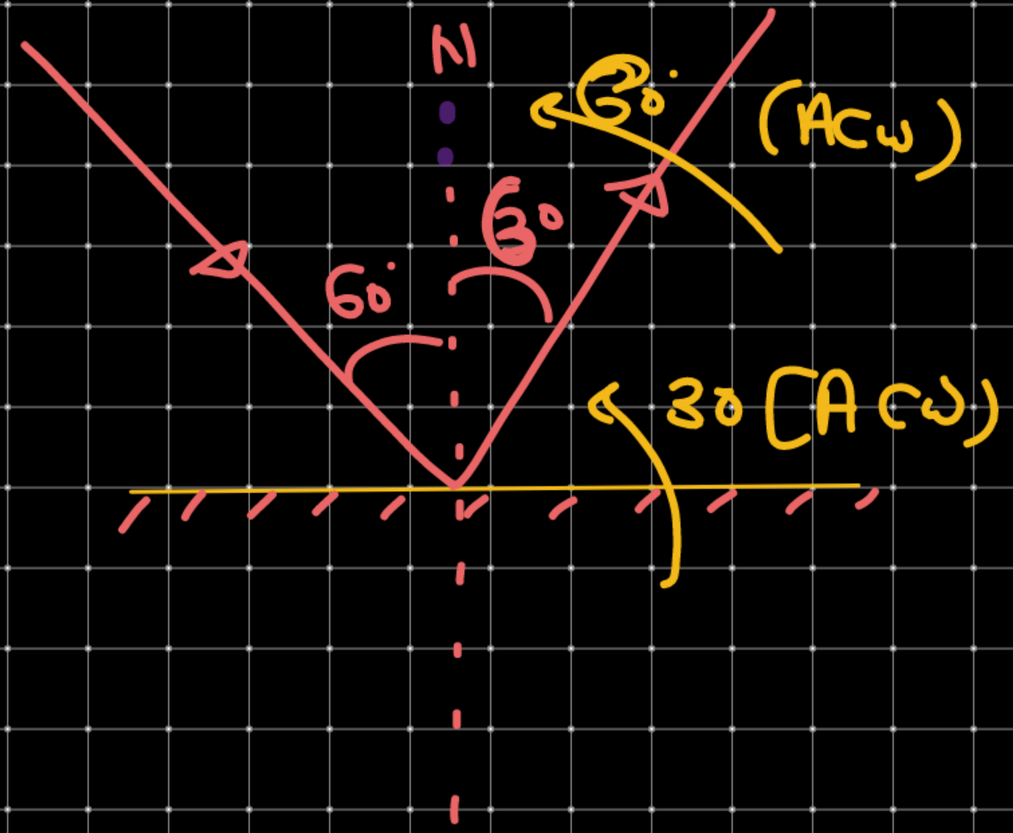
Q11



Value of rotation angle of mirror such that reflected Ray make 0° with horizontal

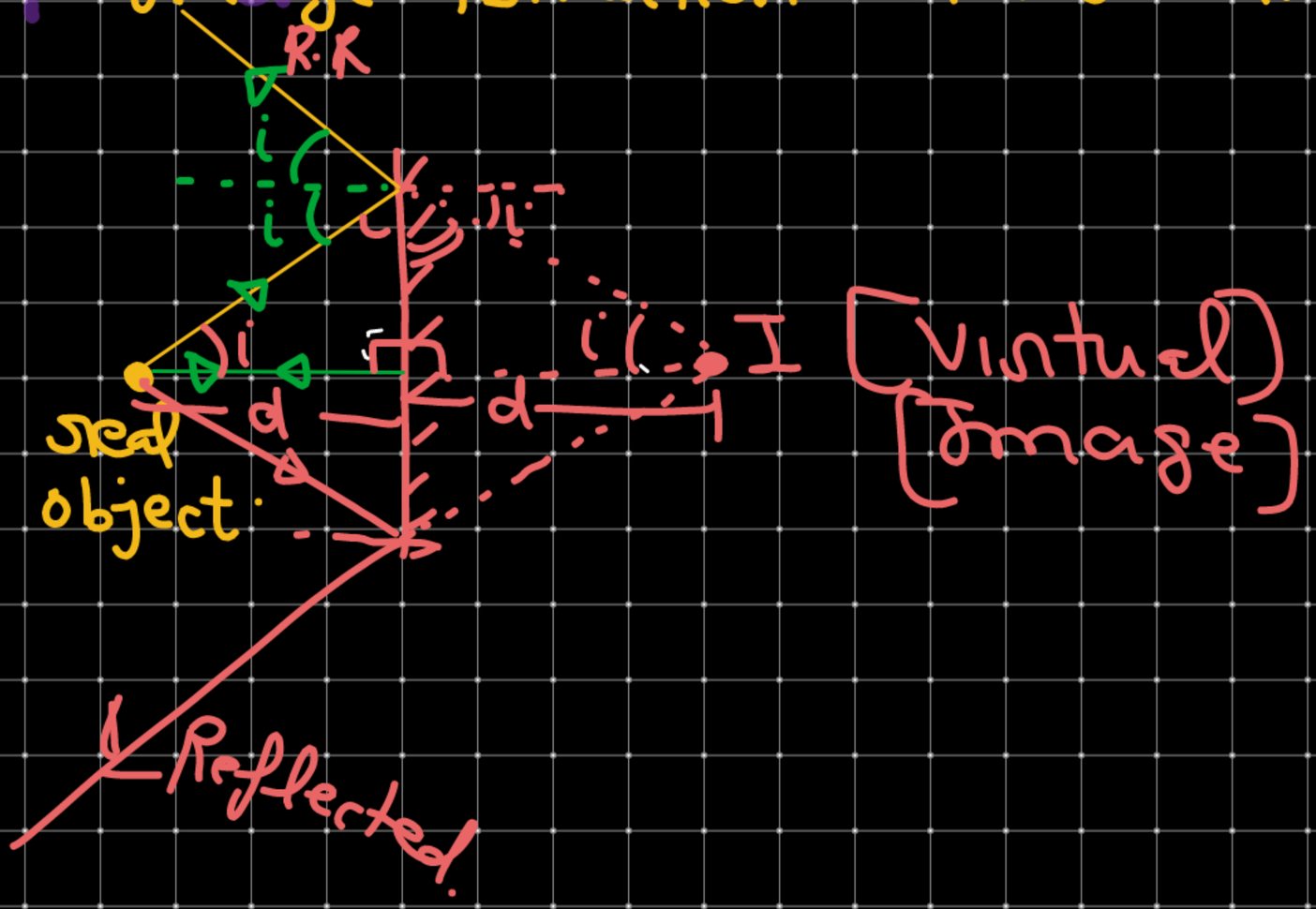
mirror θ (cw) — R.R (2θ) — Horizontal mirror

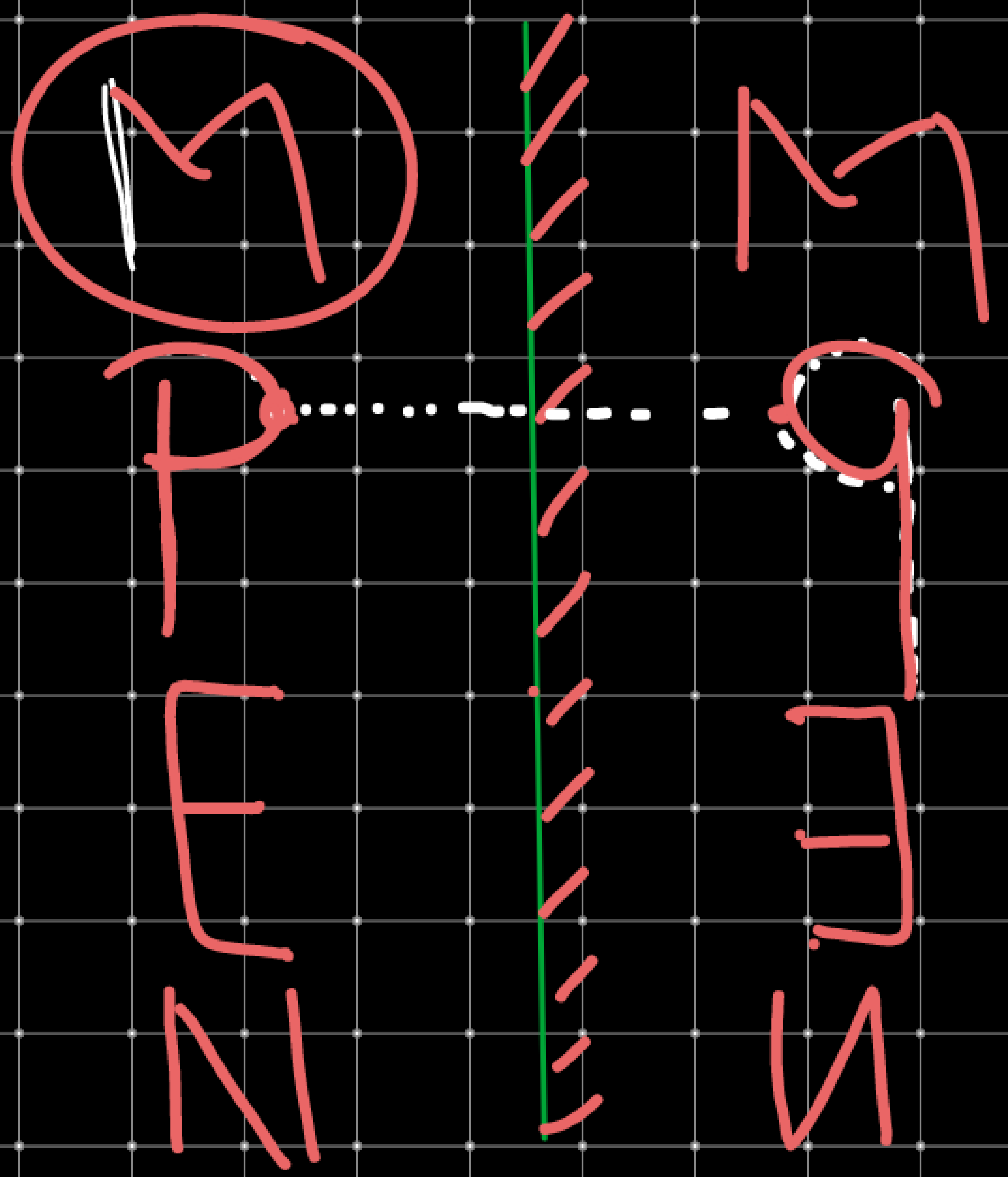
15° (cw) — 30° (c.w)

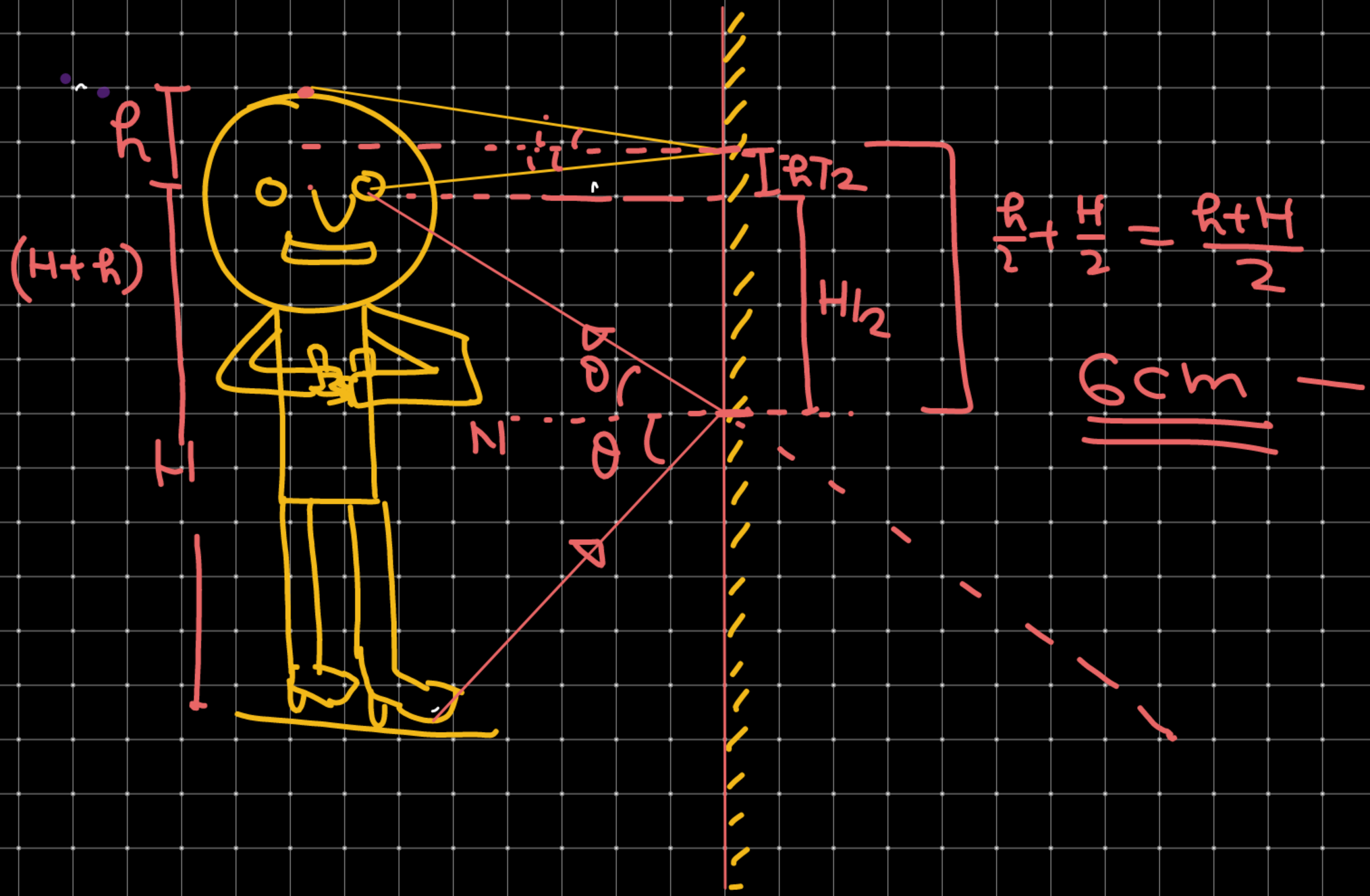


Find angle of rotation of mirror such that reflected Ray becomes vertical.

Image formation due to Plane mirror

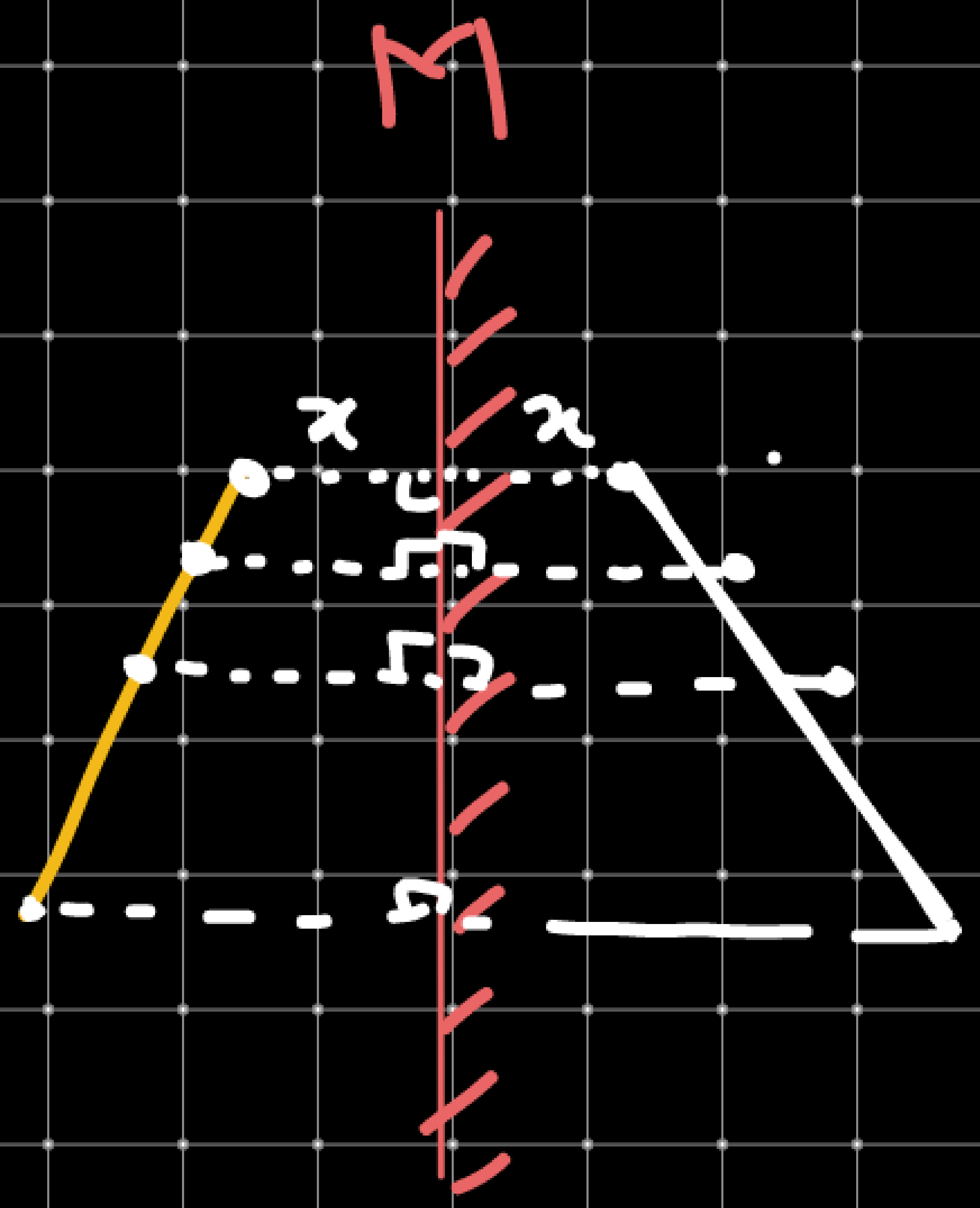



M
P
E
N

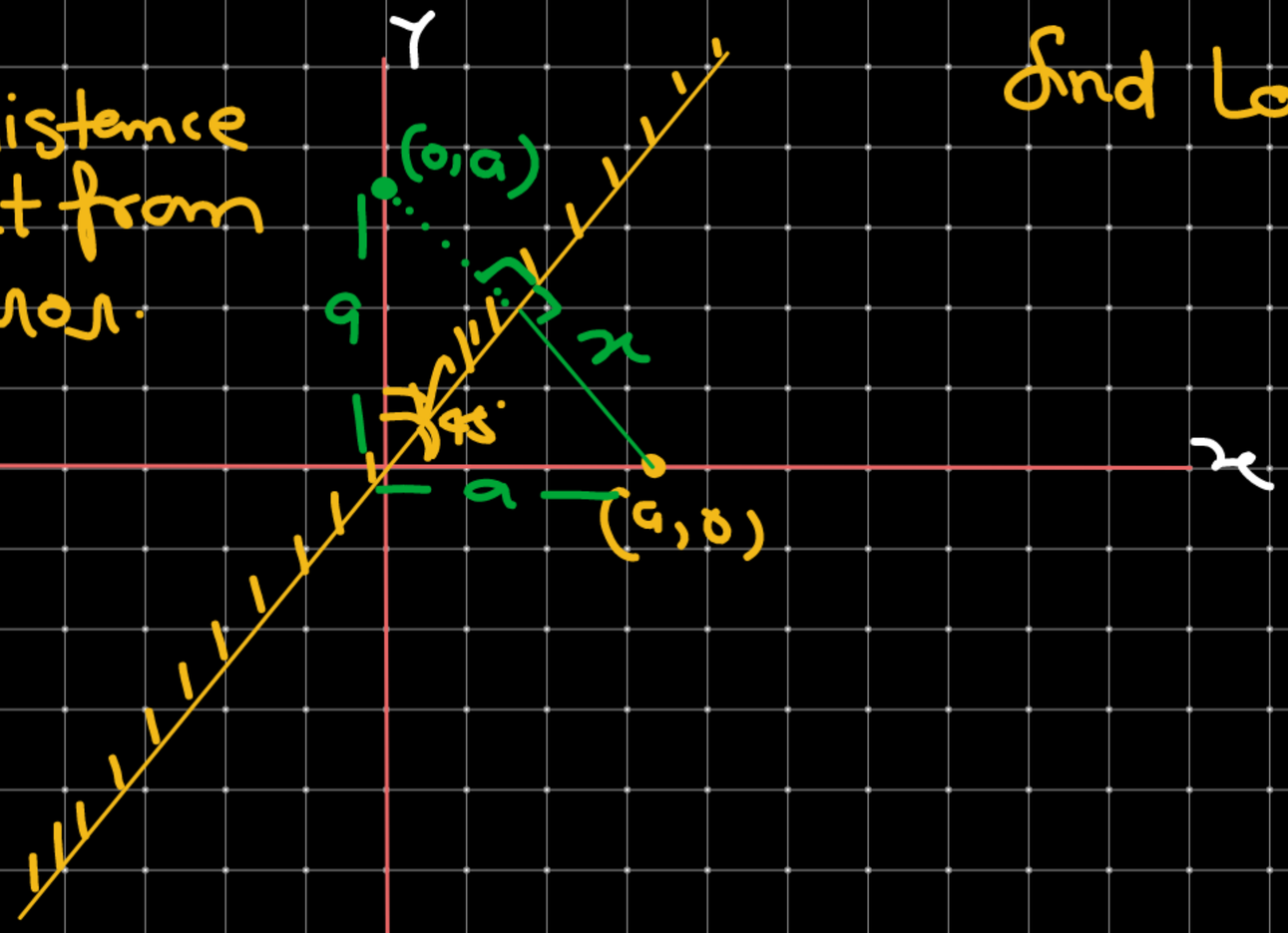


$$\frac{h}{2}+\frac{H}{2}=\frac{h+H}{2}$$

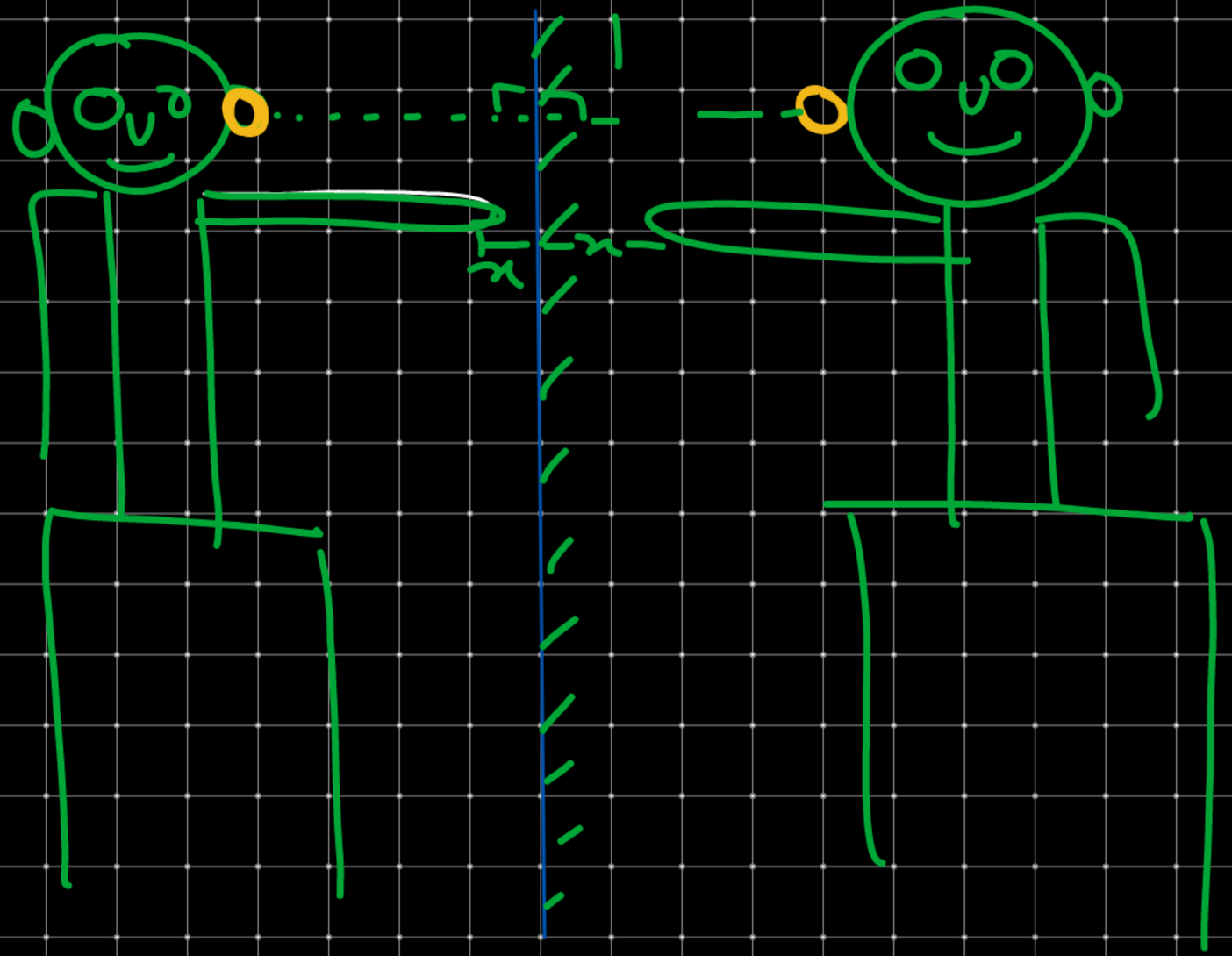
6cm


M
x
x

① ⊥ distance of object from mirror.



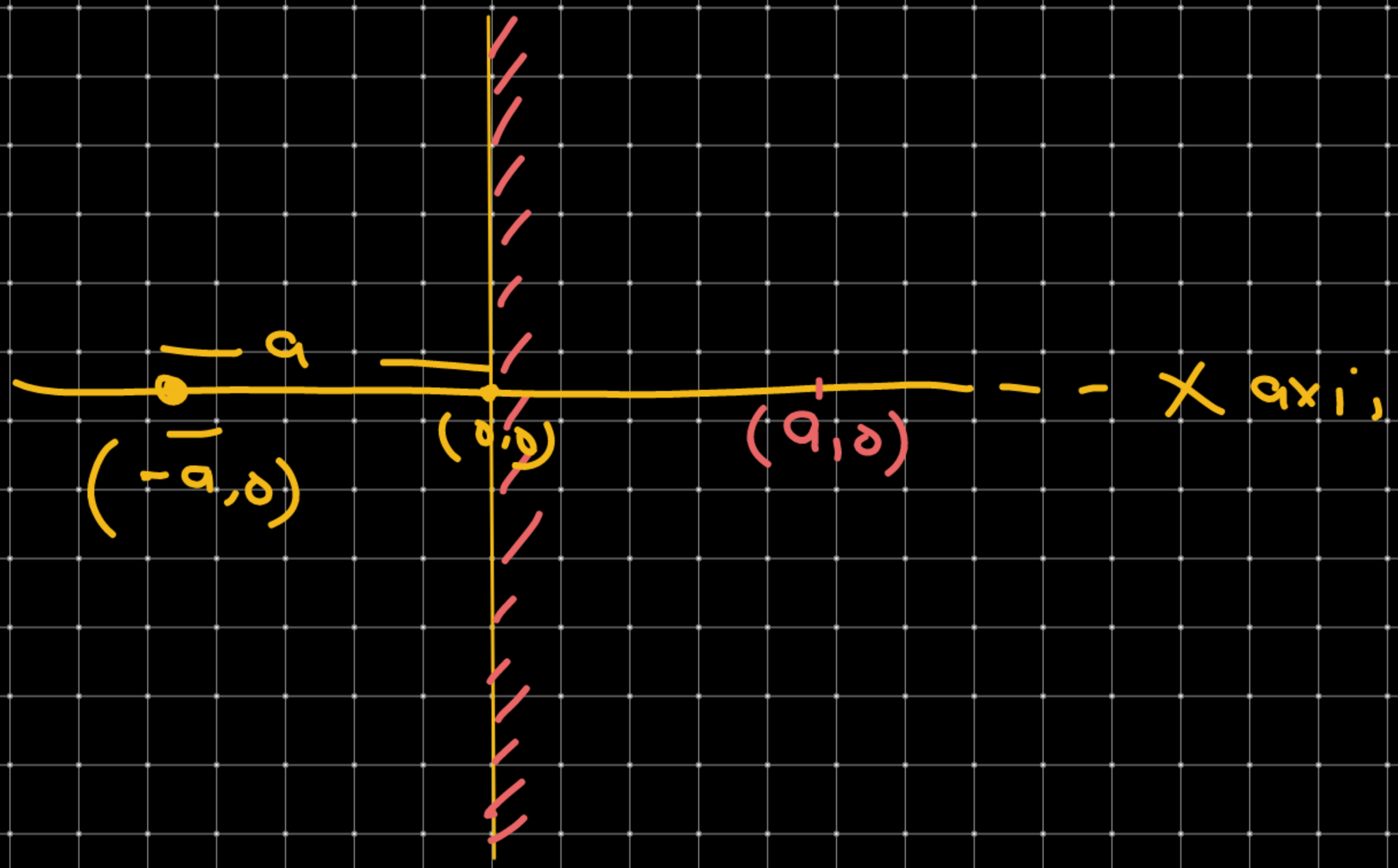
find location of Image.

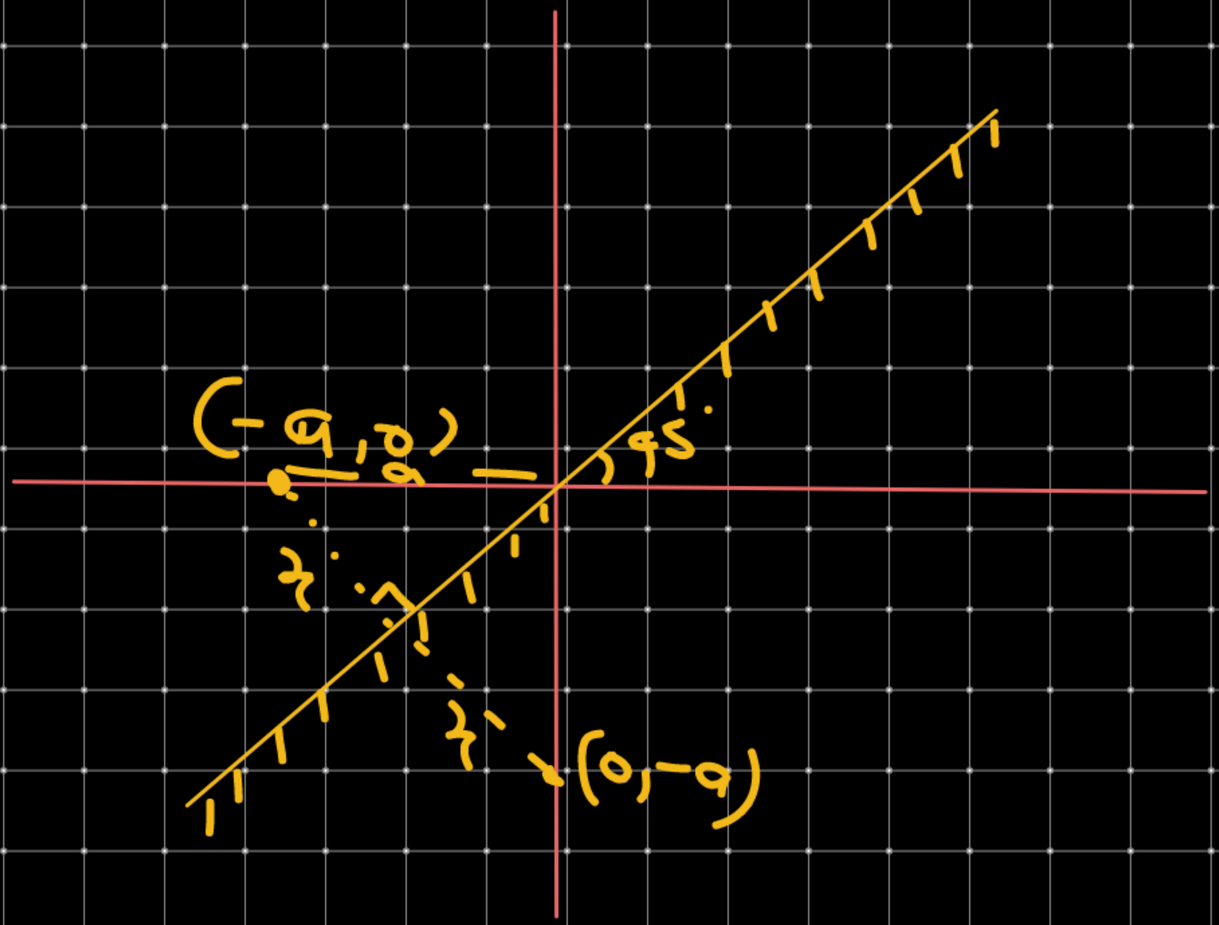


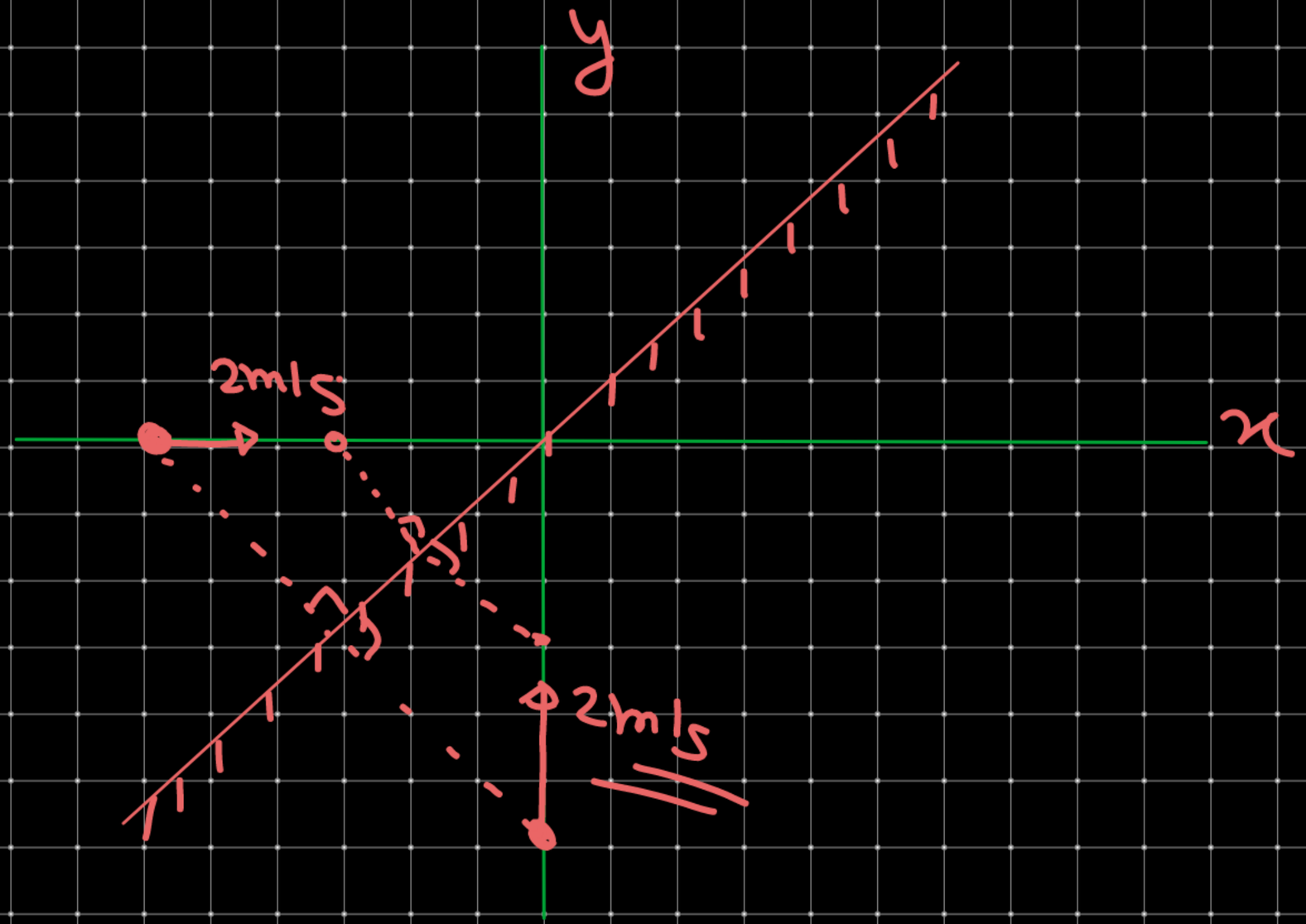
Tim

Image: where reflected Ray meet [If meet virtually, then Image formation is virtual, If reflected Ray meet in real, Image will be real.

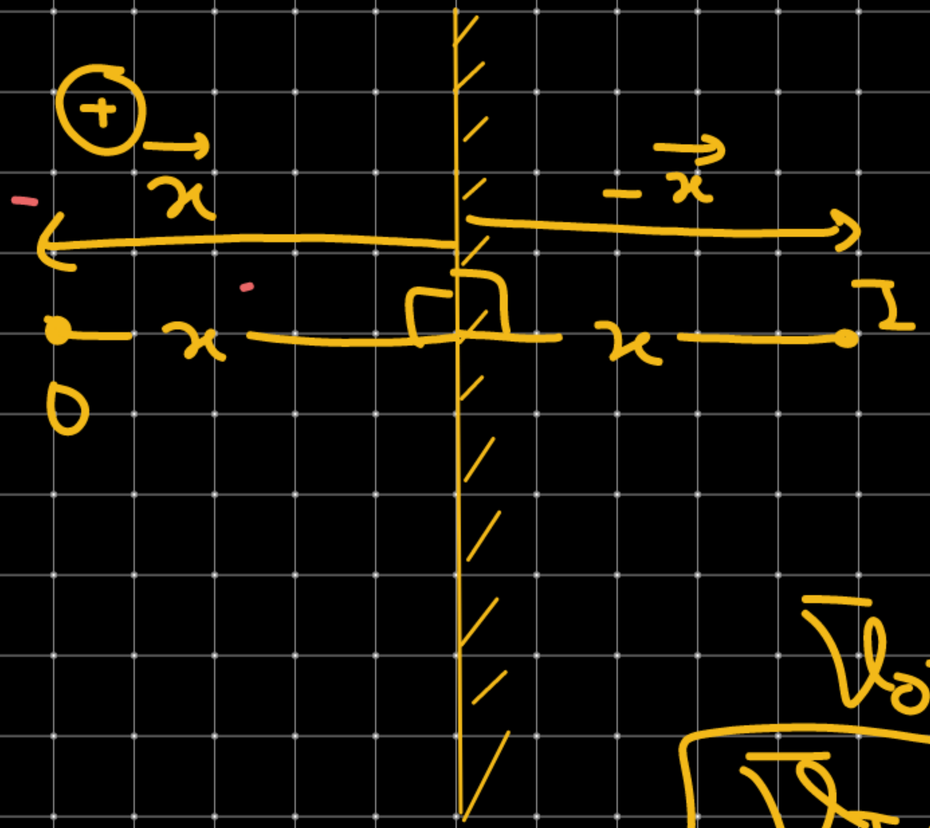
Object: Source of Ray.


a
(-a,0)
(0,0)
(a,0)
X axis


(-a, a)
45°
45°
(0, -a)


y
x
2m/s
2m/s

Velocity of Image [If mirror is fixed]



$$\vec{x}_{om} = -\vec{x}_{Im}$$

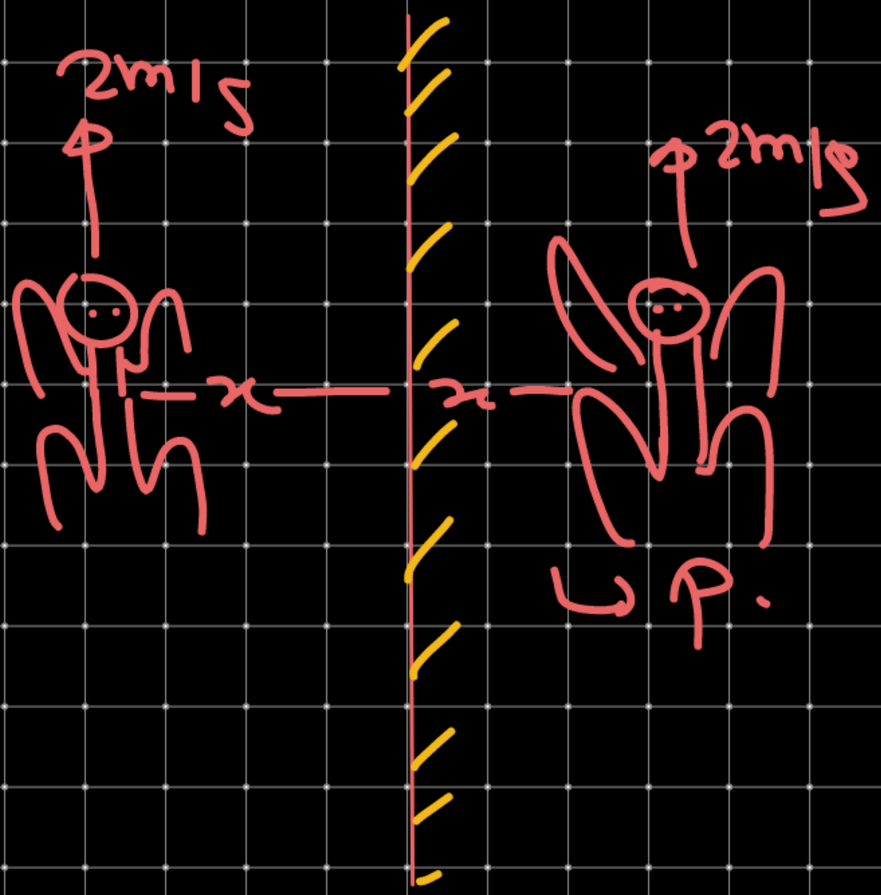
diff w.r.t time.

$$\frac{d}{dt}(\bar{x}_{om}) = -\frac{d}{dt}(\bar{x}_{Im})$$

$$\bar{v}_{om} = -\bar{v}_{Im}$$

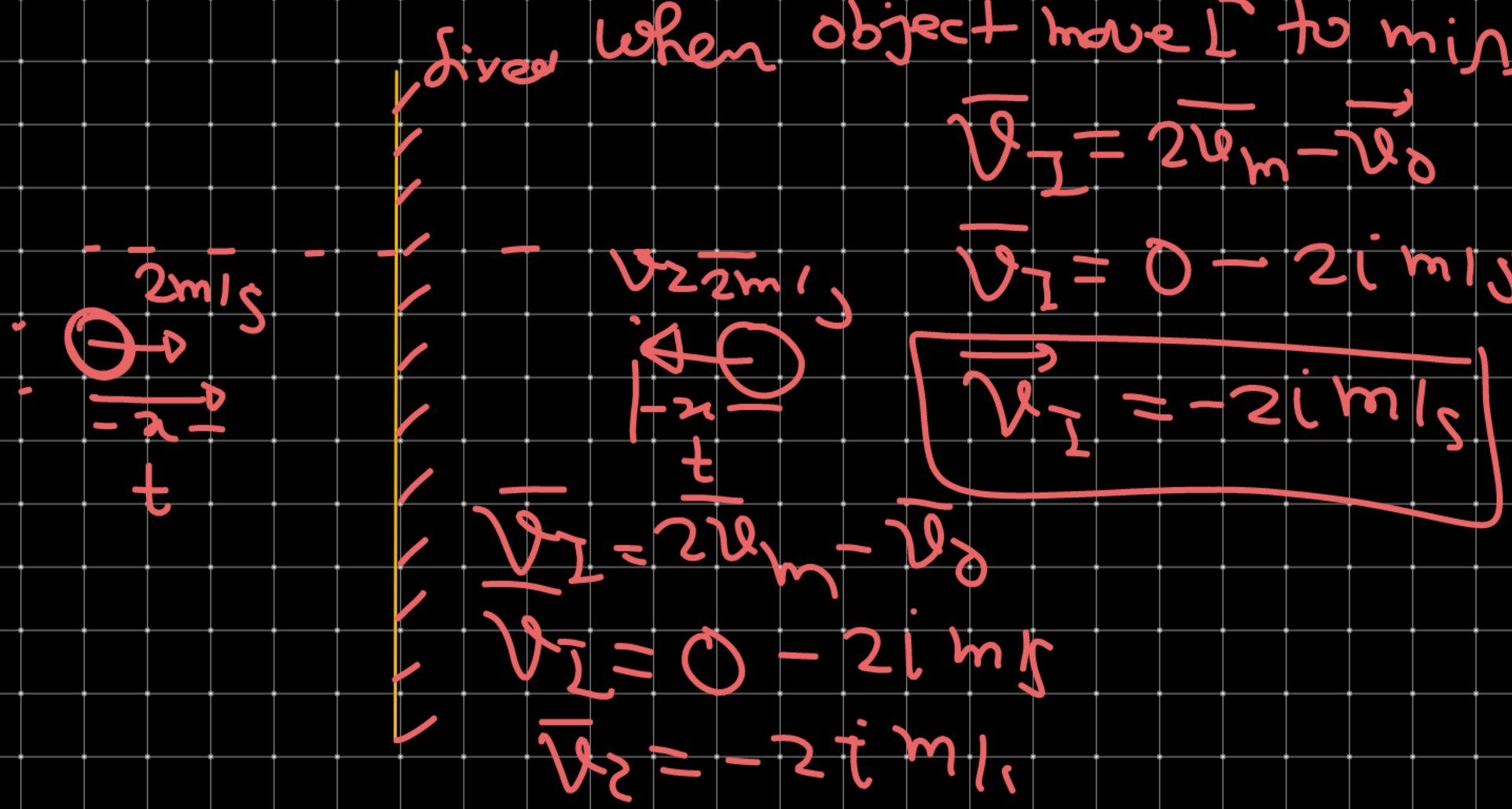
$$\bar{v}_o - \bar{v}_m = -[\bar{v}_I - \bar{v}_m]$$

$$\boxed{\bar{v}_I = 2\bar{v}_m - \bar{v}_o}$$



$$\boxed{\vec{v}_I = \vec{v}_0}$$

$$\vec{v}_I = \vec{v}_0 = 2\hat{j}\ m/s$$



diver when object move ⊥r to mirror

$$\vec{v}_I = 2\vec{v}_m - \vec{v}_o$$

$$\vec{v}_I = 0 - 2i\,m/s$$

$$\boxed{\vec{v}_I = -2i\,m/s}$$

$$\vec{v}_I = 2\vec{v}_m - \vec{v}_o$$

$$v_I = 0 - 2i\,m/s$$

$$\vec{v}_2 = -2i\,m/s$$