


concept of plane mirror Ray optics (3-4 marks) (6)

(4) $\uparrow v_o$

 $\overset{v}{I} = ?$
 (a) v_o (b) $-v_o$ (c) $+2v_o$ (d) $-2v_o$

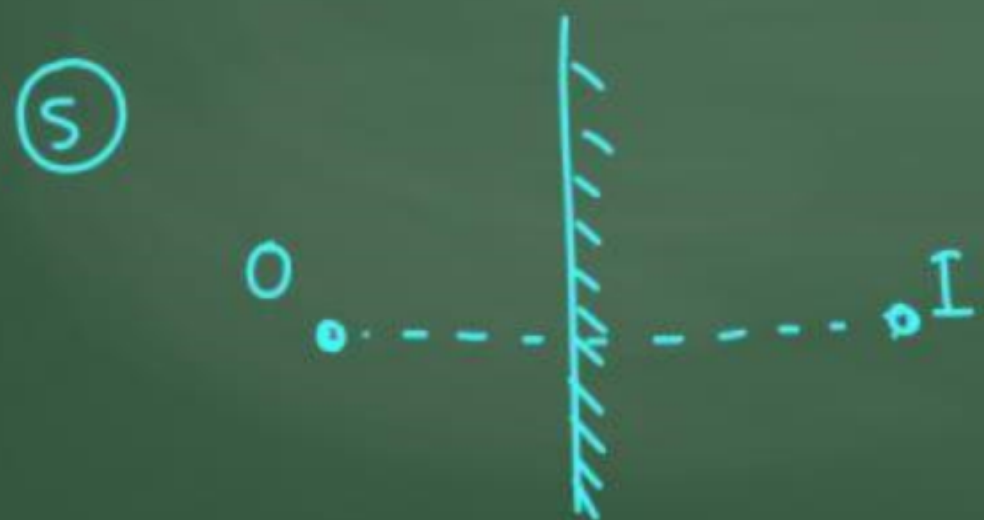
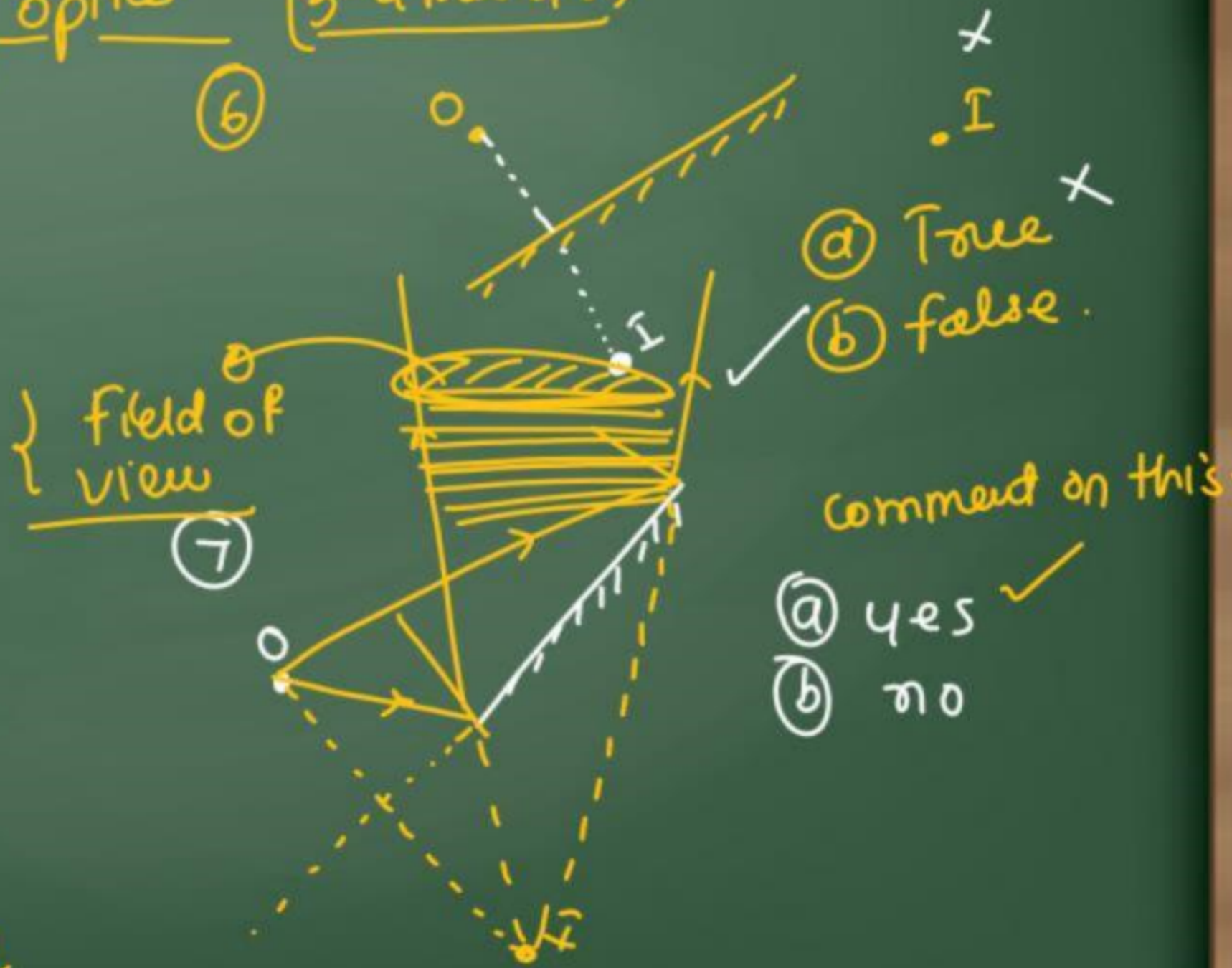


Image must be perpendicular to object always.

(7) 

Field of view

(a) True
 (b) false

Comment on this:
 (a) yes ✓
 (b) no

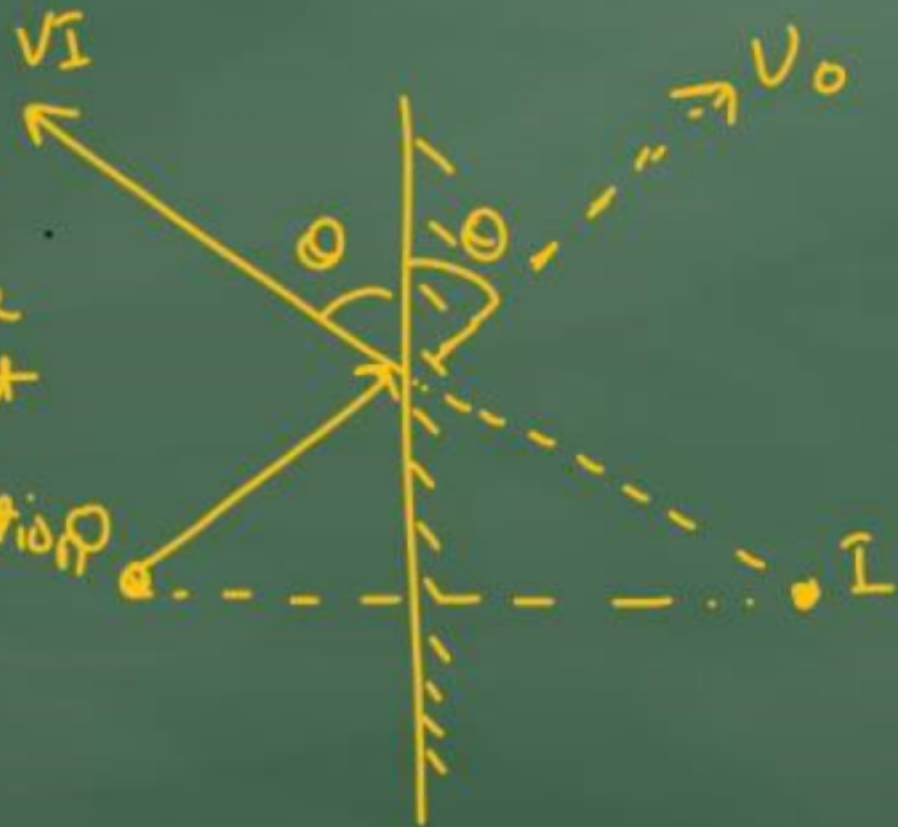
⑧ component of velocity
at 1

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concept of plane mirror Ray optics (3-4 marks)

⑧ component of velocity of image.

Image velocity will make the same angle but in opp. direction



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velocity of obj

$$= 2\hat{i} + 3\hat{j} - 3\hat{k}$$

image velocity



Ⓐ $2\hat{i} + 3\hat{j} - 3\hat{k}$

Ⓑ $-2\hat{i} - 3\hat{j} + 4\hat{k}$

Ⓒ $-2\hat{i} - 3\hat{j} - 4\hat{k}$

Ⓓ $2\hat{i} + 3\hat{j} + 3\hat{k}$

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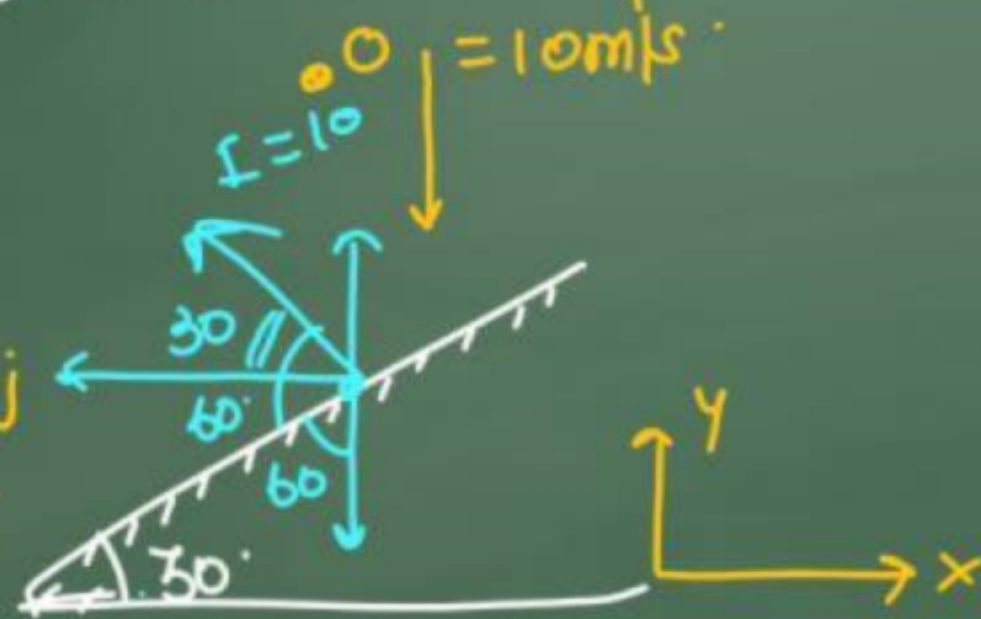
✓ (a) $\frac{4\pi}{\pi}$
image velocity = ?

(a) $10 \cos 30^\circ i + 10 \sin 30^\circ j$

(b) $-10 \cos 30^\circ i - 10 \sin 30^\circ j$

✓ (c) $-10 \cos 30^\circ i + 10 \sin 30^\circ j$

(d) none



$-10 \cos 30^\circ i + 10 \sin 30^\circ j$

concept of plane mirror

⑩ Reflected rays shifting

(a) θ in same

(b) 2θ in same

(c) θ in opp.

(d) 2θ in opp.



Ray optics

(3-4 marks)

⑪

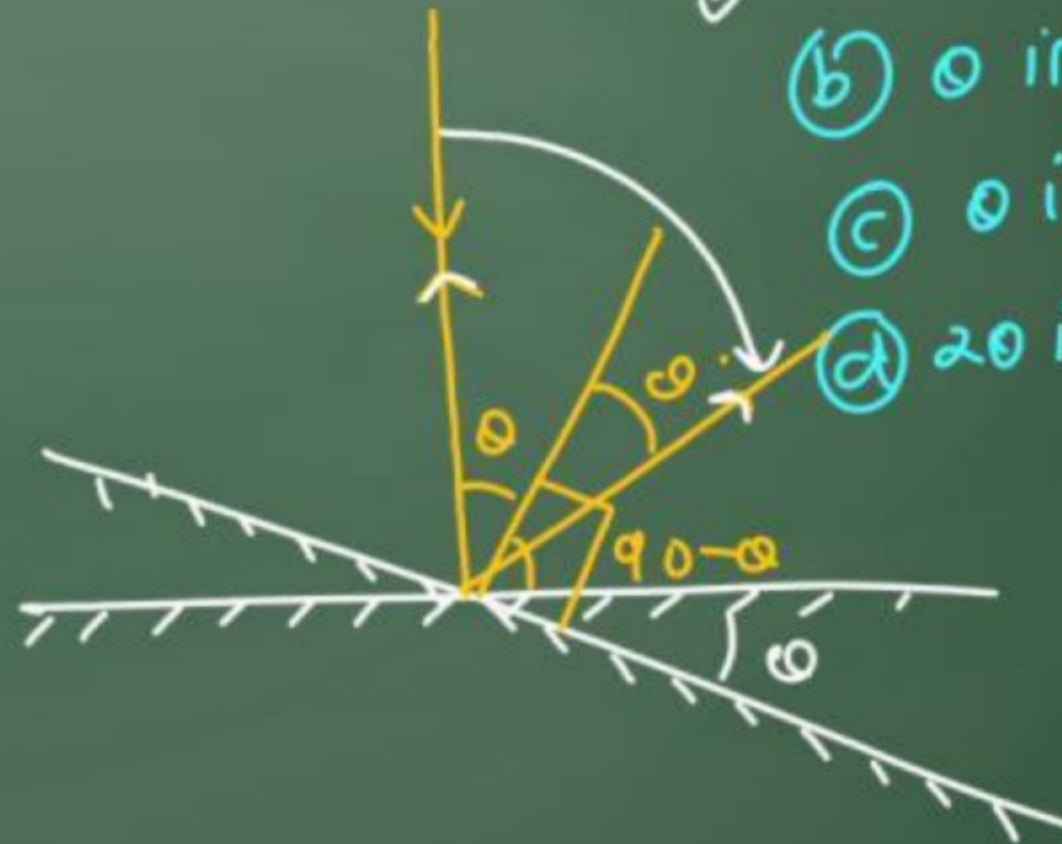
Reflected rays shifting

(a) 2θ in same

(b) θ in same

(c) θ in opp.

(d) 2θ in opp.



concept of plane mirror Ray optics (3-4 marks)

11



num of image = ?

(a) $\frac{360}{\theta} = m = \text{even}$

num of im = $m - 1$

(b) $\frac{360}{\theta} = m = \text{odd}$

bisector

$n = \text{img} = (m - 1)$

not on bisector

$n = m$

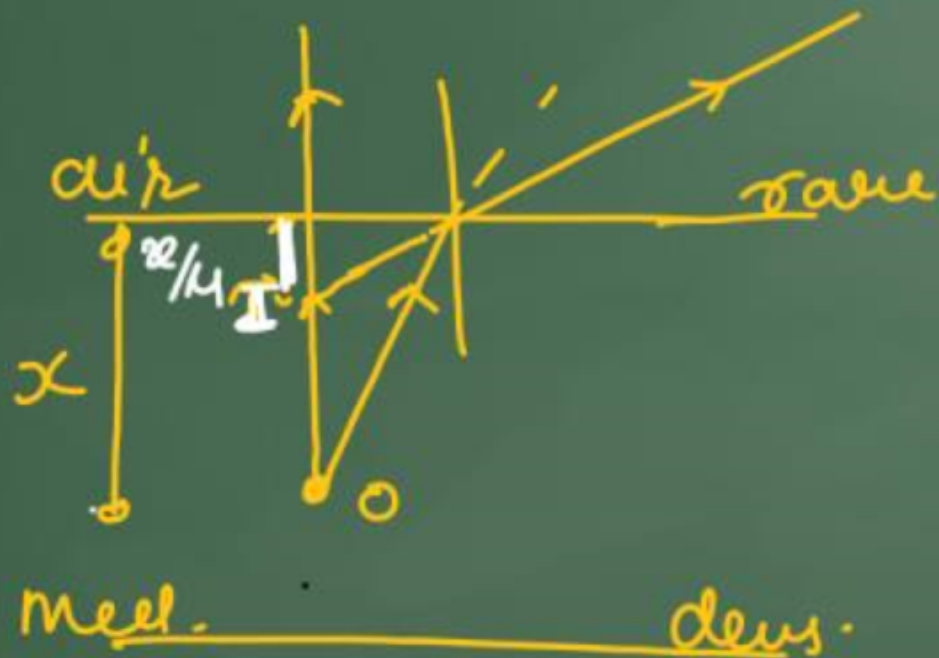
Ray optics

day 2

concept of app. depth & shift

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4 marks]

(12)



Rare → Dens → R → O

ORO

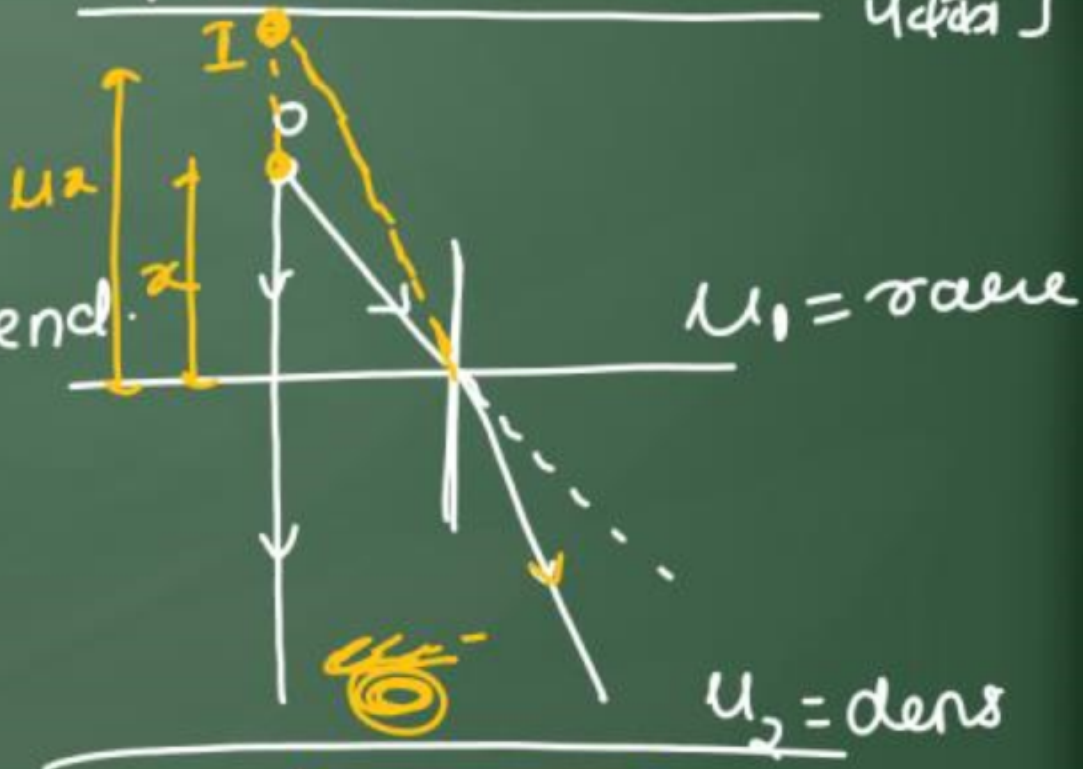
$$\rightarrow \frac{\mu_2}{\mu_1} = \frac{h_o}{h_i} \rightarrow h_i = \frac{h_o \mu_1}{\mu_2}$$

$$h_i = \frac{h_o}{\mu} = \frac{x}{\mu}$$

(13)

R-O-B

Rare → dens → Bend.



R O I

$$\frac{\mu_2}{\mu_1} = \frac{h_i}{h_o} \Rightarrow h_i = \frac{\mu_2 h_o}{\mu_1}$$

$$= \mu x$$

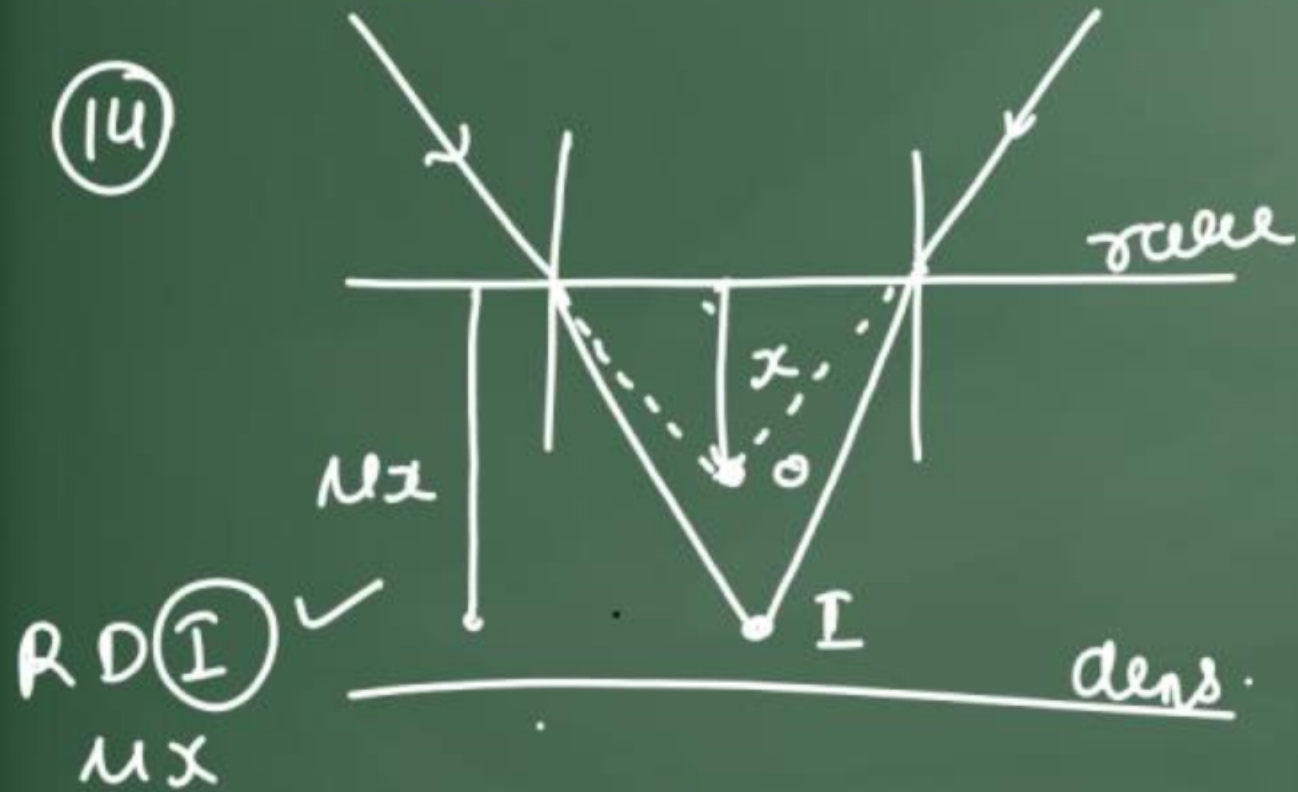
Ray optics

day 2

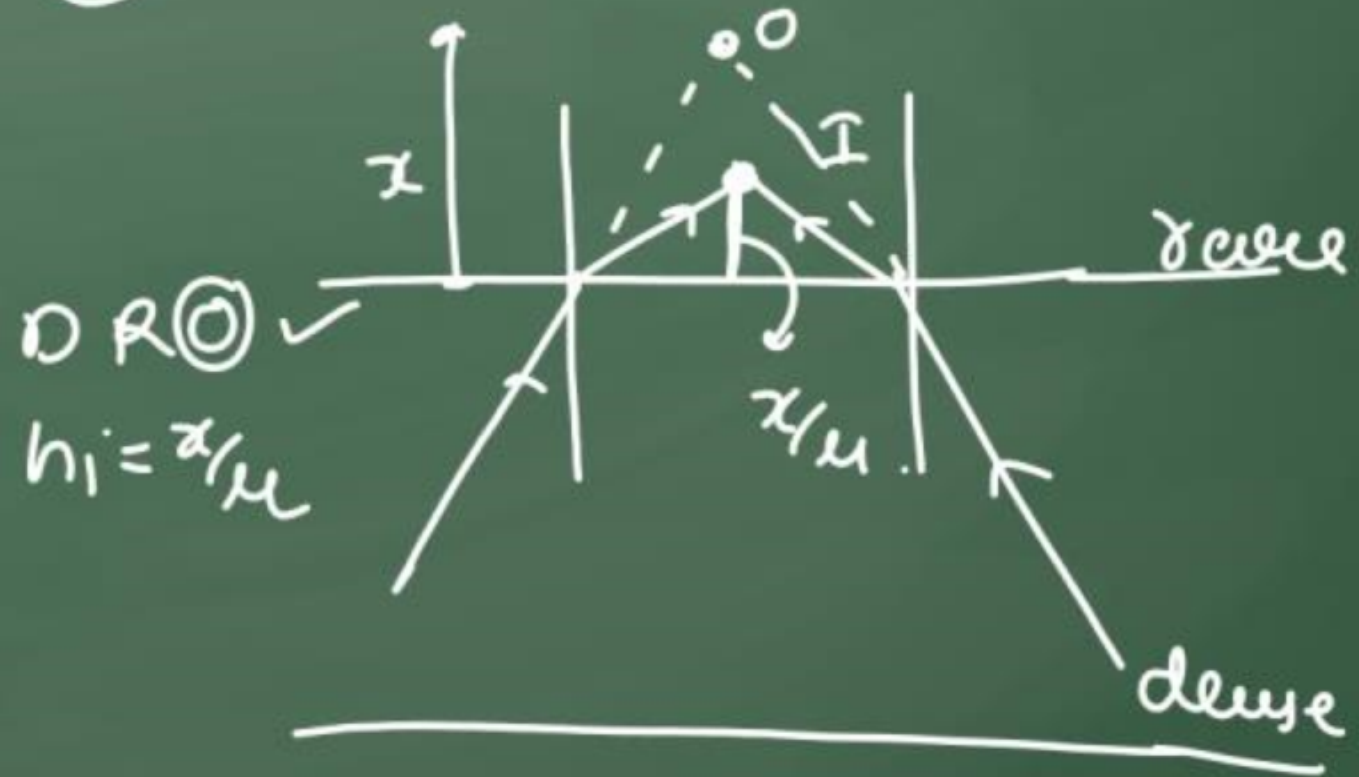
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4 marks]

(14)



(15)



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day 2

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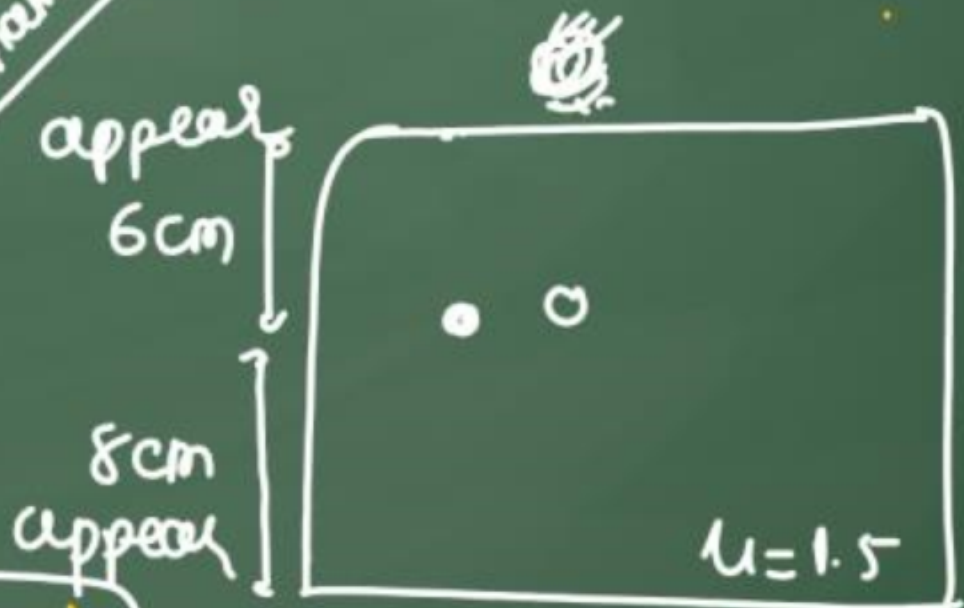
16) NEET
Bottom point
will appear = ?

$n_i = x/\mu$



$$d_{app} = \frac{d_1}{\mu_1} + \frac{d_2}{\mu_2}$$

17) NEET/JEE
NEET



thickness of the slab = ?

प्रश्न ? ?

$$d_{app} = \frac{d}{\mu}$$

$$d_o = d_a \times \mu \quad | \quad d_o = 8 \times 1.5 = 6 \times 1.5$$

- 1) 15×14
- 2) $\frac{14}{1.5}$
- 3) $\frac{1.5}{14}$
- 4) none

Ray optics

day-2

concept of app. depth & shift

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4 marks]

18

4 marks

E_1 will appear to $E_2 = ?$



E_2 will appear to $E_1 = ?$

DRO

$$d_{app} = \frac{x}{u} = \frac{10 \times 3}{42} = \frac{15}{7} \text{ cm}$$

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R D I ✓

$$d_{app} = xu$$

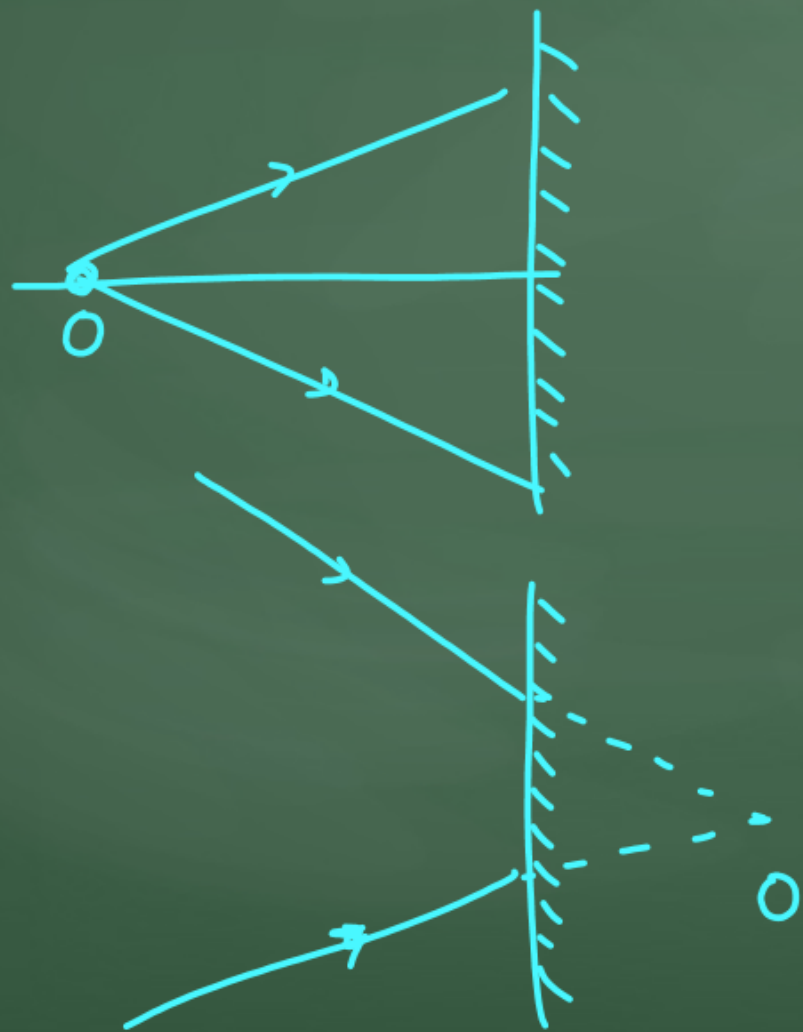
$$= 10 \times \frac{4}{3}$$

$$= \frac{40}{3} \text{ cm}$$

Mirror formula + Image Velocity (Ray optics for NEET/JEE)

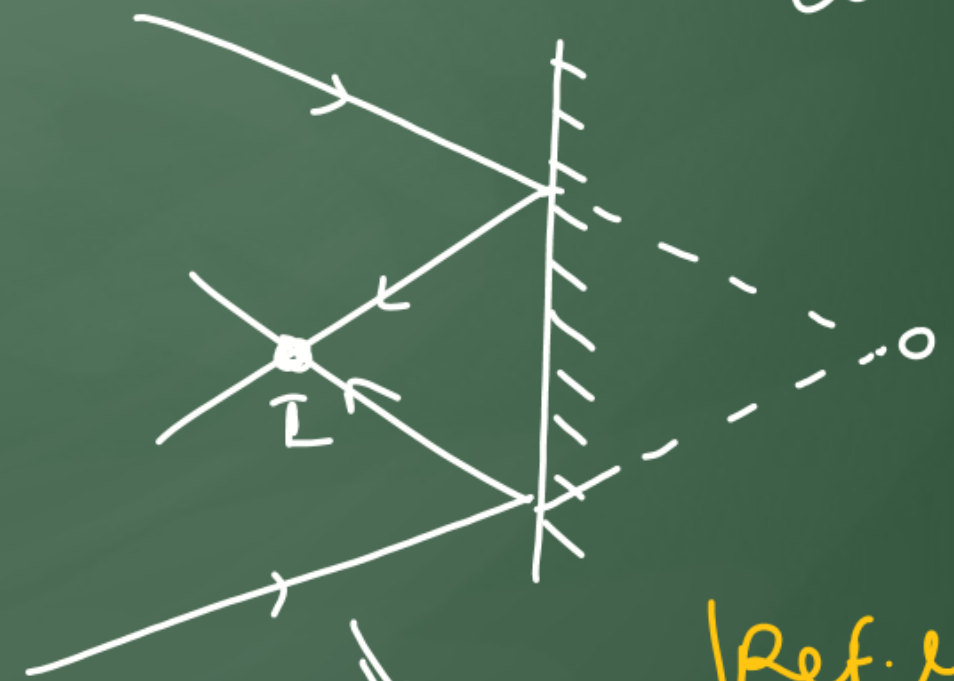
19) Image object की उदाहरण

Real object / Incident rays diverging rays.



Incident rays.
Converging rays.
Virtual object

Real image → Reflected converge



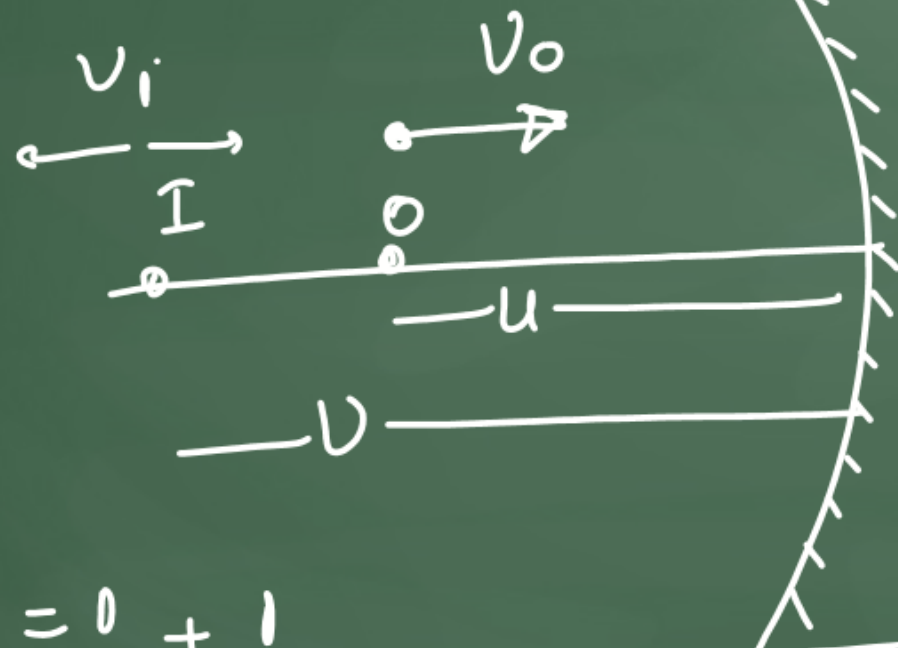
Ref. rays diverge
Virtual image



Mirror formula + Image Velocity (Ray optics for NEET/JEE)

20) Image velocity along the axis

(a)



$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

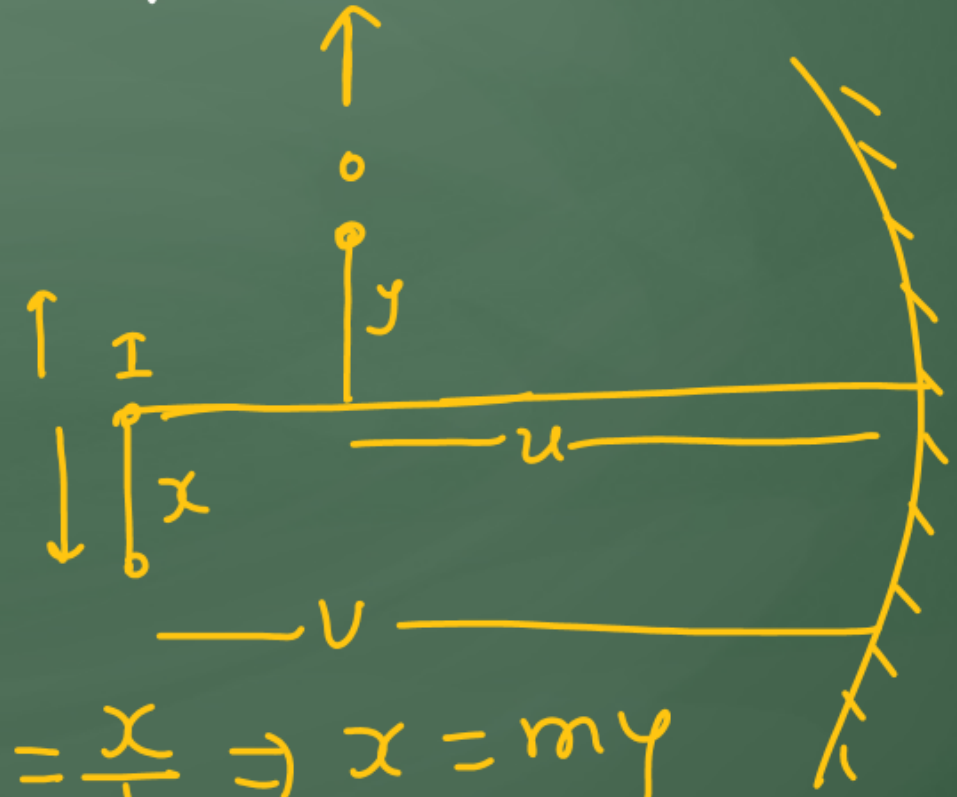
$$\frac{1}{f} = v^{-1} + u^{-1}$$

$$0 = -\frac{1}{v^2} \frac{dv}{dt} - \frac{1}{u^2} \frac{du}{dt}$$

$$v_i = -m^2 v_o$$

(b)

perpendicular to axis



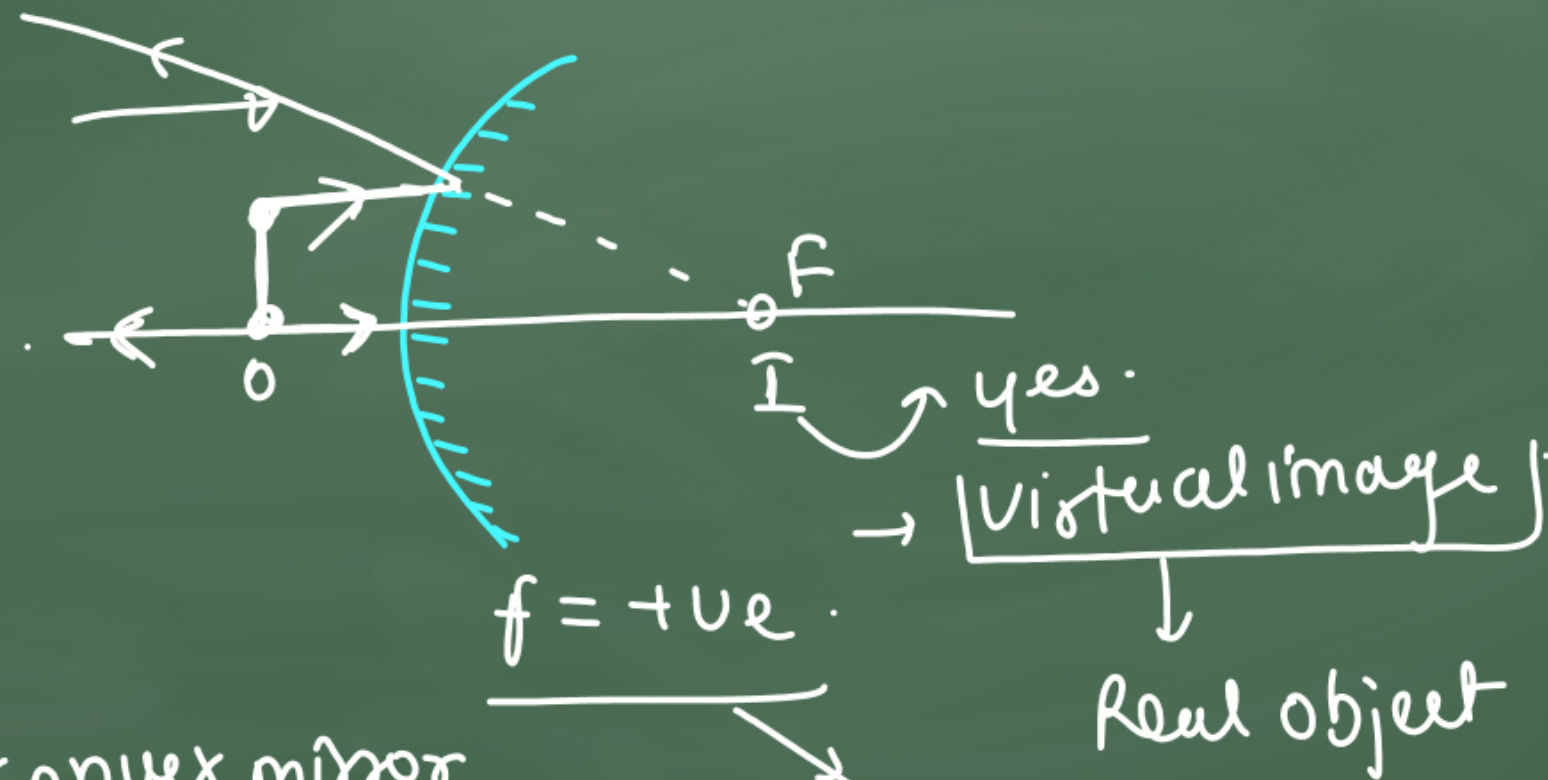
$$m = \frac{x}{y} \Rightarrow x = my$$

$$\frac{dx}{dt} = m \frac{dy}{dt}$$

$$v_i = m v_o$$

②① Best question on mirror formula + Image Velocity (Ray optics for NEET/JEE)

① Can a convex mirror forms a virtual image??



$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

② Can a convex mirror form a real image??
✓ Yes.



22

Mirror formula + Image Velocity
 find position of image
 for concave mirror
 when image size is 4 times
 than object having focal length
 10 cm.

- ✓ (a) 12.5 cm (b) 13.5 cm
- ✓ (c) 7.5 cm ✓ (d) both a & c

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(a) Real image

$$u = -x$$

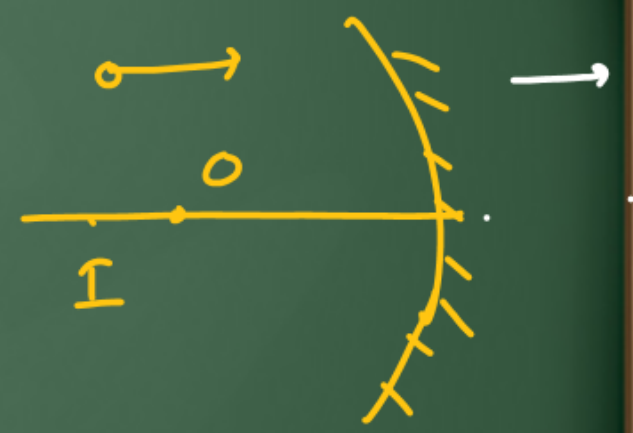
$$v = -4x$$

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\rightarrow \frac{1}{-10} = \frac{1}{-4x} - \frac{1}{x}$$

$$\Rightarrow \boxed{x = 12.5 \text{ cm}}$$

(Ray optics for NEET/JEE)



(b) image virtual

$$u = -x$$

$$v = +4x$$

$$\boxed{\frac{1}{f} = \frac{1}{v} + \frac{1}{u}}$$

$$\Rightarrow \boxed{x = 7.5 \text{ cm}}$$

Mirror formula + Image Velocity (Ray optics
for NEET/JEE)

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day 2

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