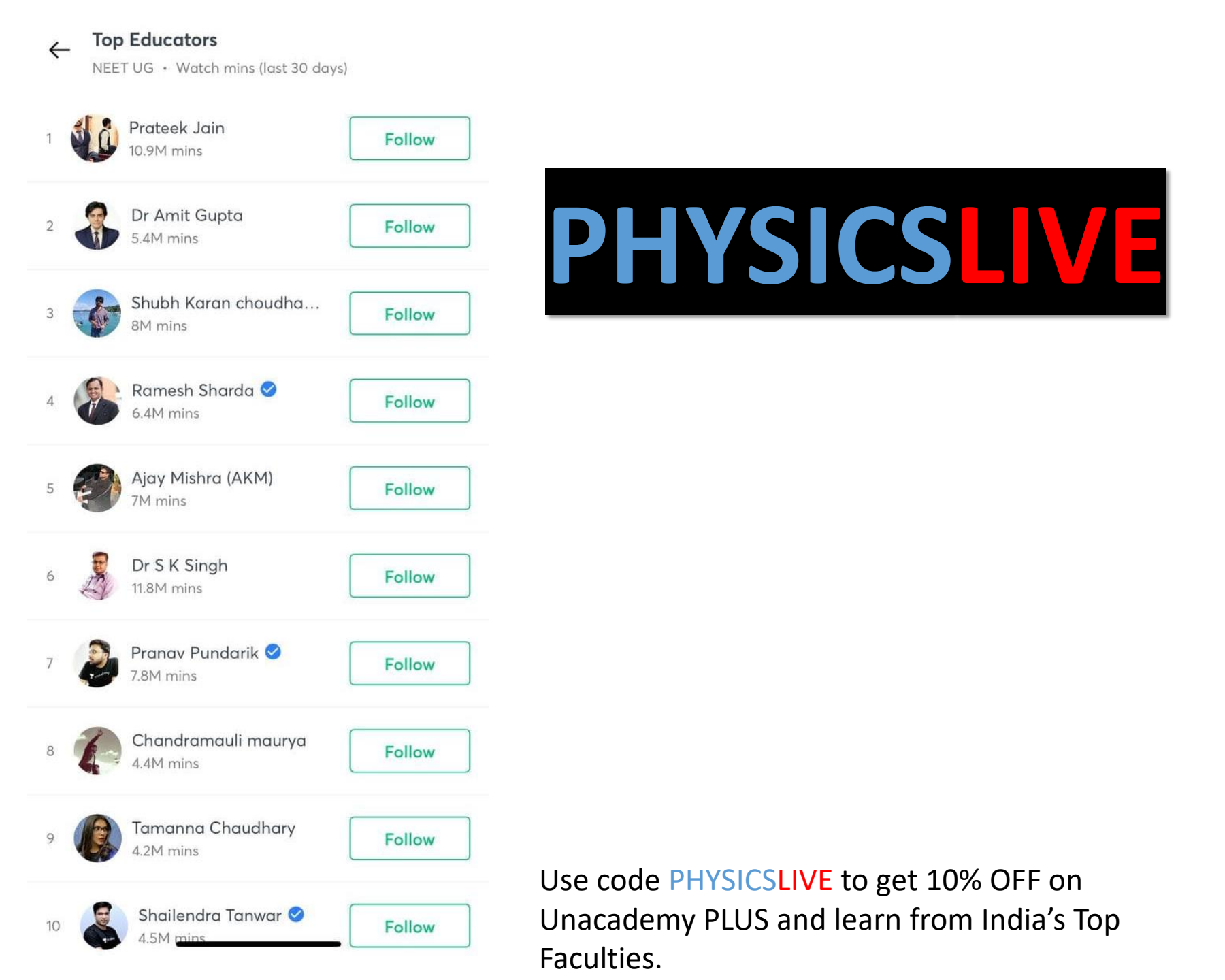
SIR PRATEEK JAIN

- **IIT JEE & NEET Faculty (KOTA)**
- **Top Physics Faculty on Unacademy.**
- **8+ years of teaching experience**
- **Research work with HC Verma sir at IIT Kanpur**
- **Produced ranks like AIR 6, AIR 10 etc.**



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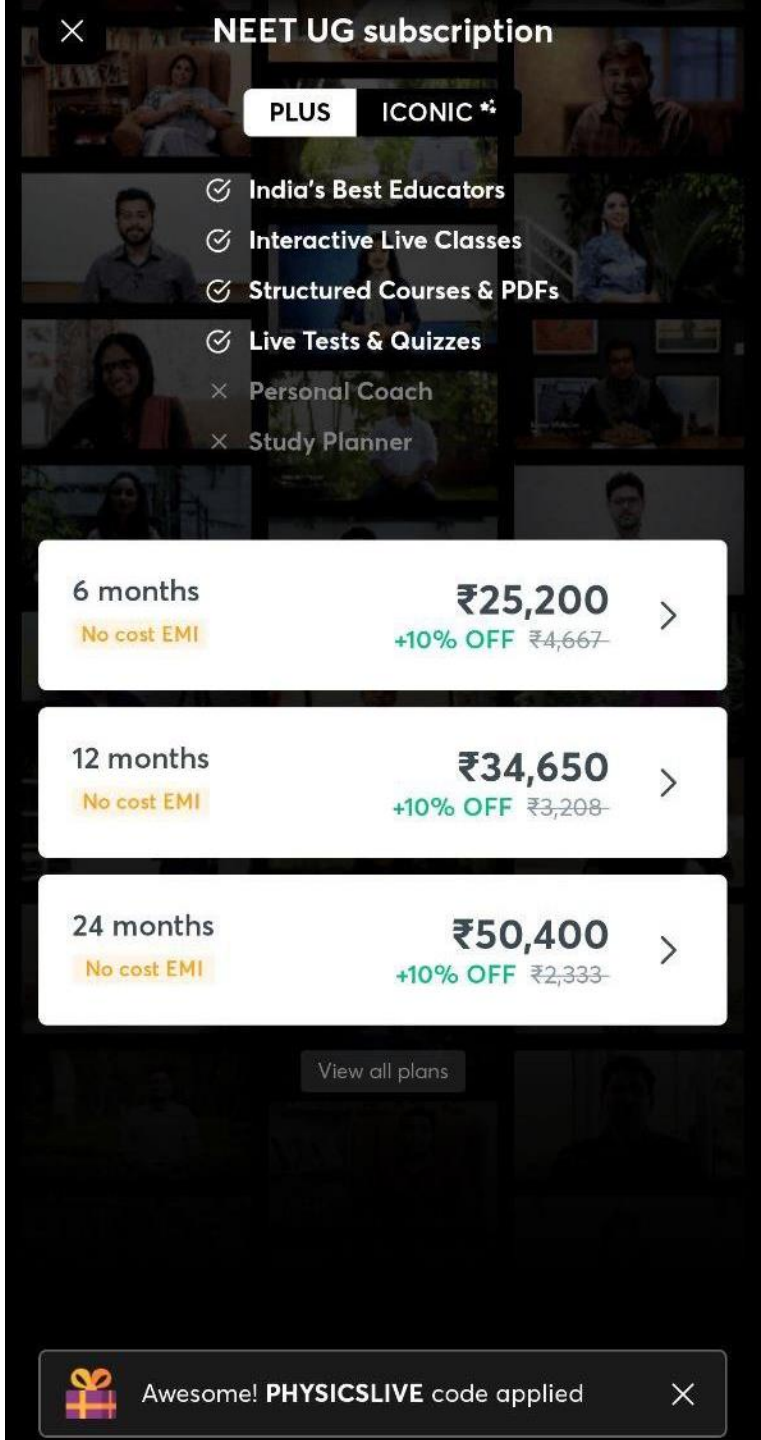

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NEET
Physics DPP

DPP-1 Plane Mirror, Real, Virtual, Rotation of Image, Velocity of Image

By PRATEEK JAIN SIR

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Q) When reflection from a plane mirror incident ray, normal & reflected ray all are

(a) In same plane
(b) mutuallu perpendicular
(c) Parallel
(d) None of the above

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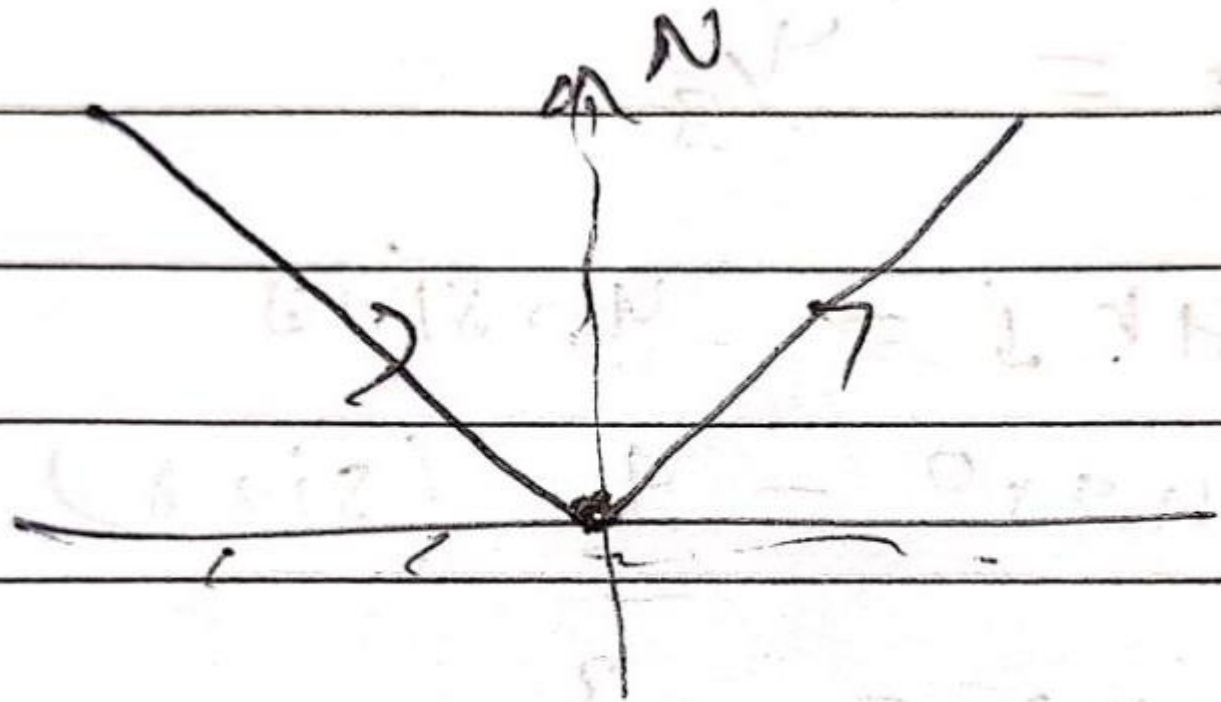
Ans. a



all are co-planer.

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Q) A rays is incident at an angle 38º with the normal on a mirror. The angle between normal and reflected ray is

(a) 38º (b) 52º (c) 90º (d) 76º

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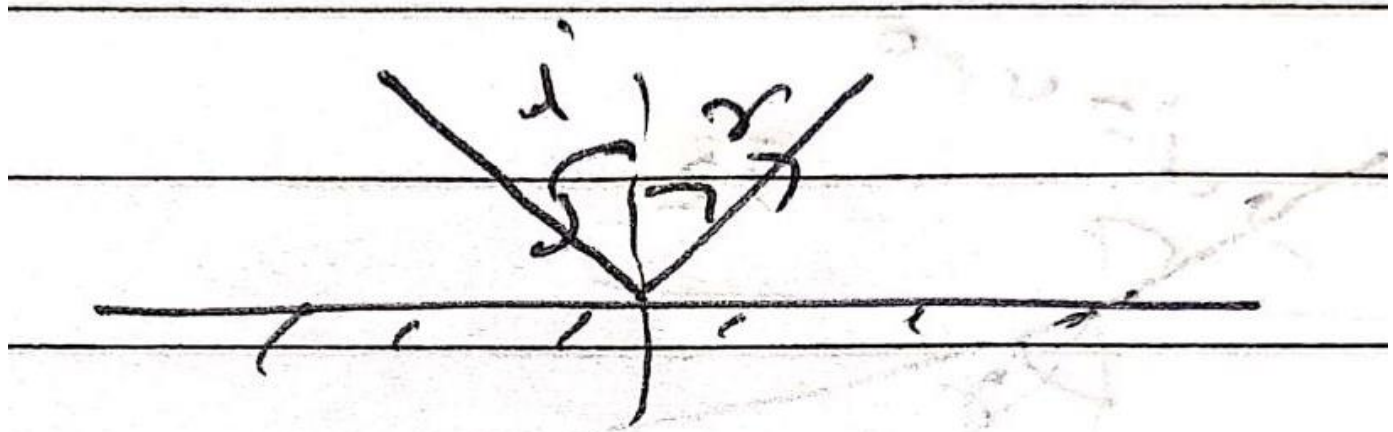
Ans. a



$x = x$

$x = 38^\circ$

So, $x = 38^\circ$

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Q) The image of a real object formed by a plane mirror is:

(a) Erect, real and of equal size
(b) Erect, virtual and of equal size
(c) Inverted, real and of equal size
(d) Inverted, virtual and of equal size

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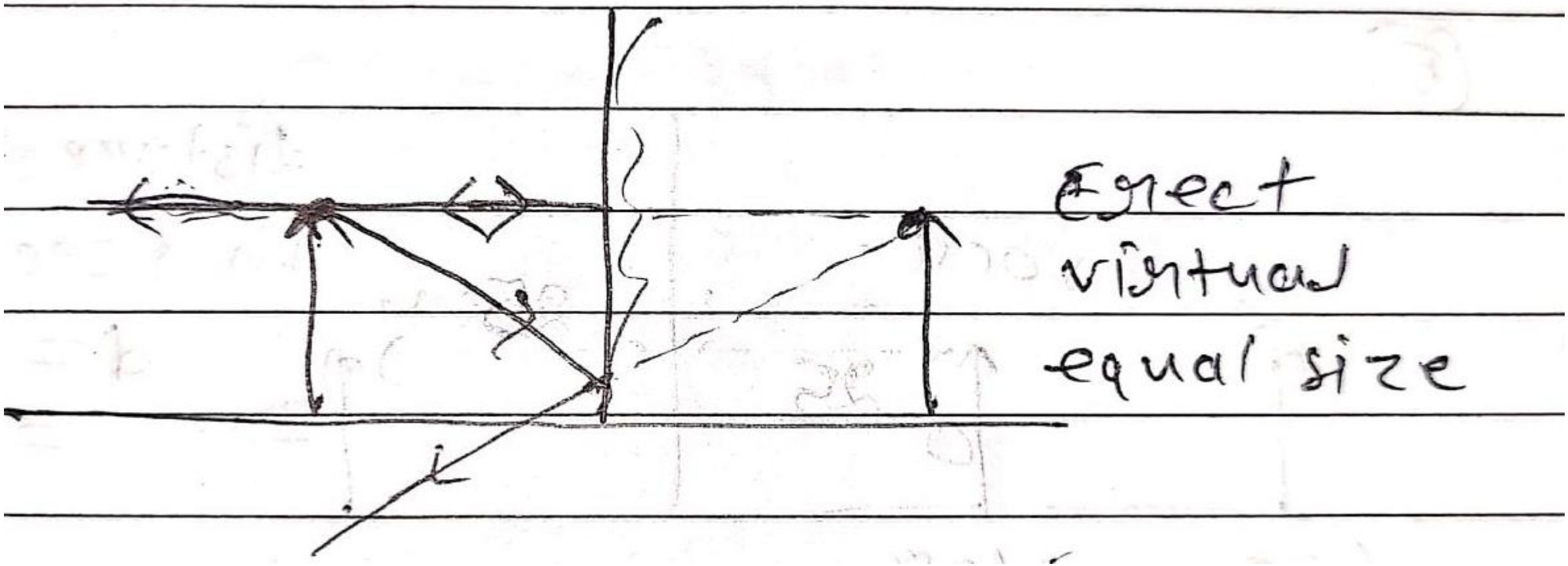
Ans. b


Erect
virtual
equal size

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Q) Mark the correct options:

(a) If the incident rays are converging, we have a real object.

(b) If the final rays are converging, we have a real image.

(c) The image of a virtual object is called a virtual image.

(d) If the image is virtual, the corresponding object is called a virtual object.

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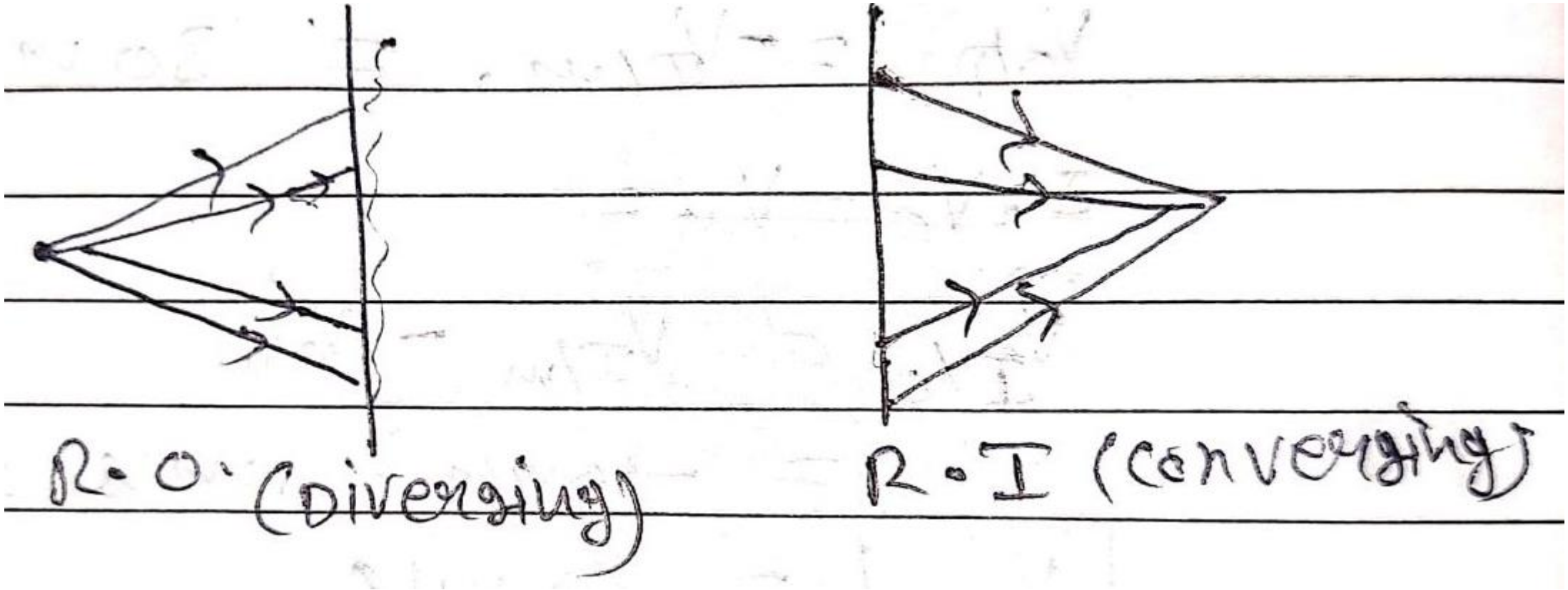
Ans. b


R.O. (Diverging)
R.I (Converging)

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Q) A point source of light is placed in front of a plane mirror:

(a) All the reflected rays meet at a point when produced backward.

(b) Only the reflected rays close to the normal meet at a point when produced backward.

(c) Only the reflected rays making a small angle with the mirror, meet at a point when produced backward.

(d) Light of different colours make different images.

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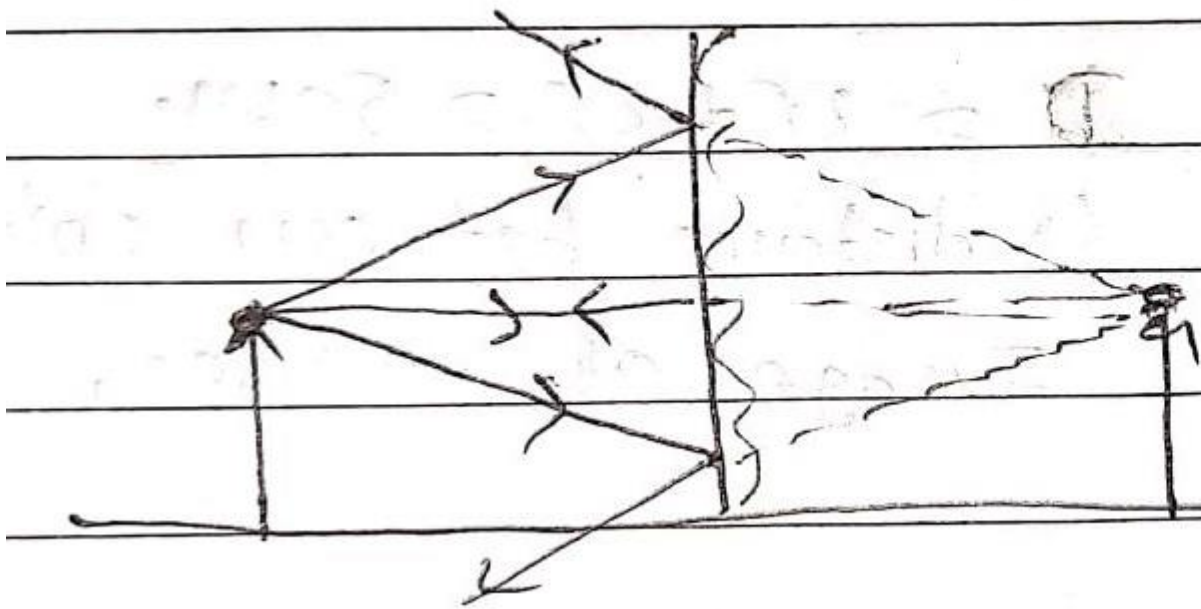
Ans. a



all reflected ray meet at a point when produced backward

Q) Which of the following is not the case with image formed by a plane mirror:

(a) It is erect

(b) It is virtual

(c) It is diminished

(d) It is at the same distance as the object

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Ans. c

Image formed by a

Plane Mirror: → erect

→ virtual

→ at same distance as object

& → same size.

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Q) A small object is 10 cm in front of a plane mirror. A man stands 30 cm from the mirror, behind the object and looks at the object's image. He should focus his eyes to see the image at a distance:

(a) 25 cm (b) 35 cm (c) 45 cm (d) 40 cm

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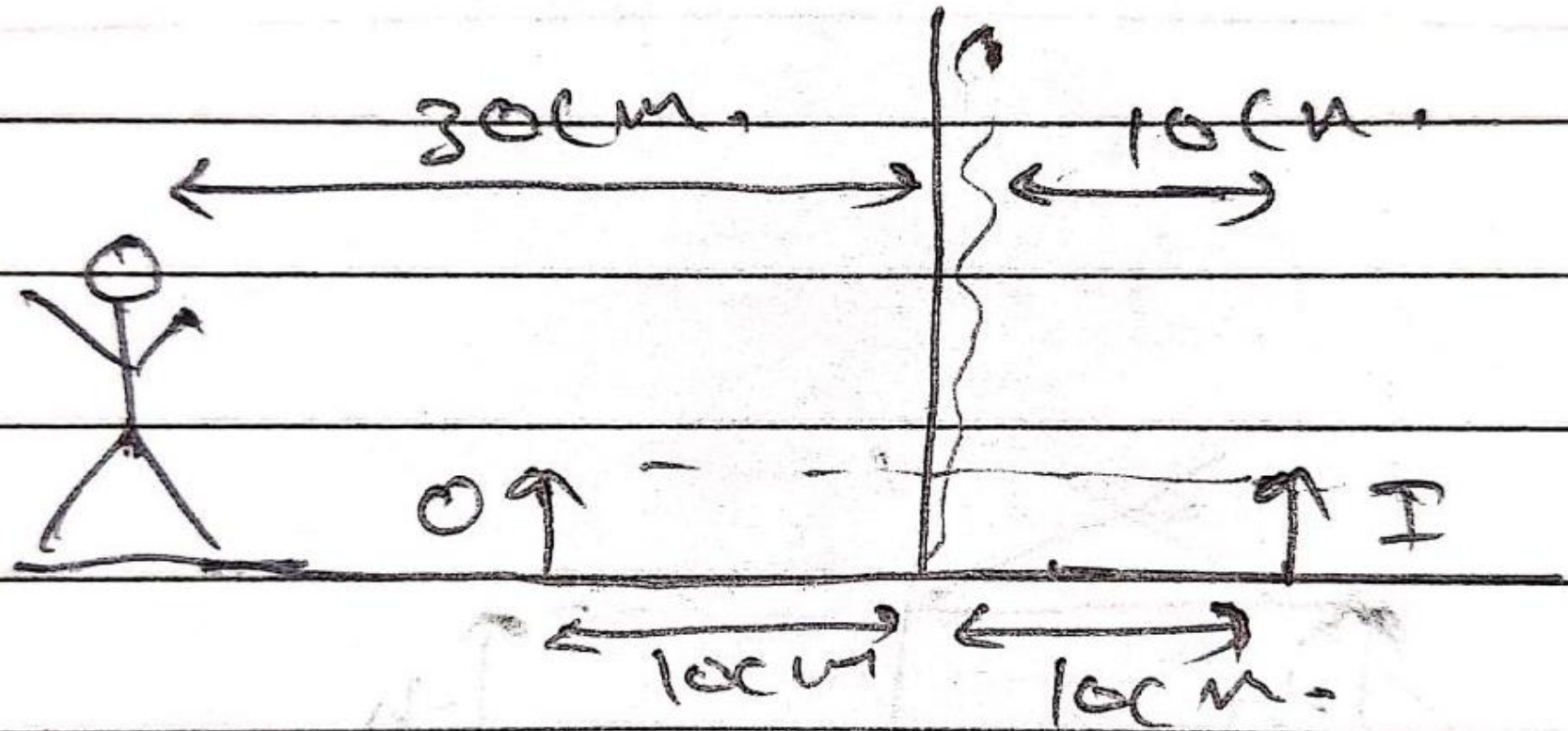
Ans. d



$$d = 30 + 10 = 40\text{cm}.$$

Q) An object is initially at a distance of 50 cm from a plane mirror. If the mirror approaches the object at a speed of 5 cm/s. Then after 5 s the distance between the object and its image will be :

(a) 60 cm (b) 140 cm (c) 50 cm (d) 25 cm

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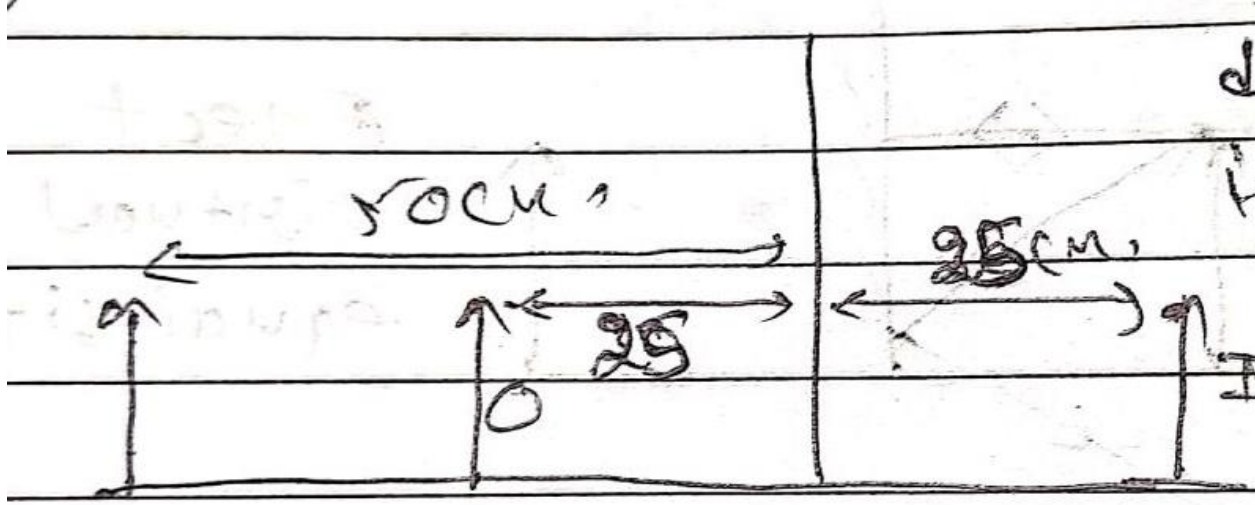
Ans. c

)



D = 25 + 25 = 50cm.

↳ distance between object and

Image at t = 5sec.

Q) A plane mirror is approaching you at 10 cm per second. You can see your image in it. At what speed will your image approach you:

(a) 10 cm/s (b) 5 cm/s (c) 20 cm/s (d) 15 cm/s

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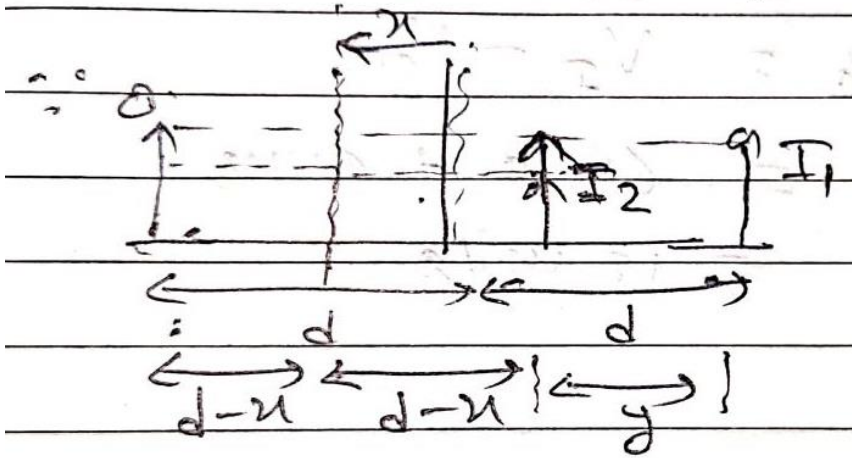
Ans. c

$V_{M/O} = 10 \text{ cm/sec.}$

$V_{I/O} = 2 V_{MO}$

$= 20 \text{ cm/s}$



$2d = (d-x) + (d-x) + y$

$y = 2x$

MIRROR

⇒ when ~~object~~ moves 'x' then Image moves '2x'

∴ when mirror moves with speed V the Image moves with speed 2V

Q) A car is moving towards a plane mirror at a speed of 30 m/s. Then the relative speed of its image with respect to the car will be-

(a) 30 m/s (b) 60 m/s (c) 15 m/s (d) 45 m/s

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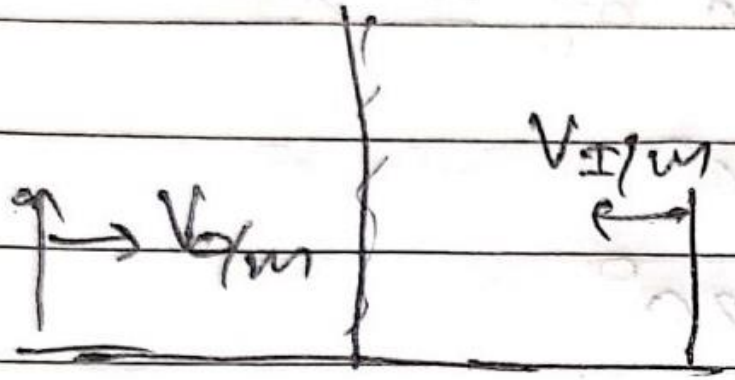
Ans. b



$V_{o/m}$ = speed of object w.r.t. mirror

$V_{I/m}$ = speed of Image w.r.t. mirror

$$\vec{V}_{o/m} = -\vec{V}_{I/m}, = 30\ m/s$$

~~① $V_o - V_m =$~~

$$\vec{V}_{I/o} = \vec{V}_{I/m} - \vec{V}_{o/m}$$

$$= -30\ m/s - 30\ m/s = -60\ m/s$$

$$|\vec{V}_{I/o}| = 60\ m/s$$

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Q) Calculate the velocity of image with respect to observer if an observer is walking away from the plane mirror with 6 m/s:

(a) 6 m/s (b) -6 m/s (c) 12 m/s (d) 3m/s

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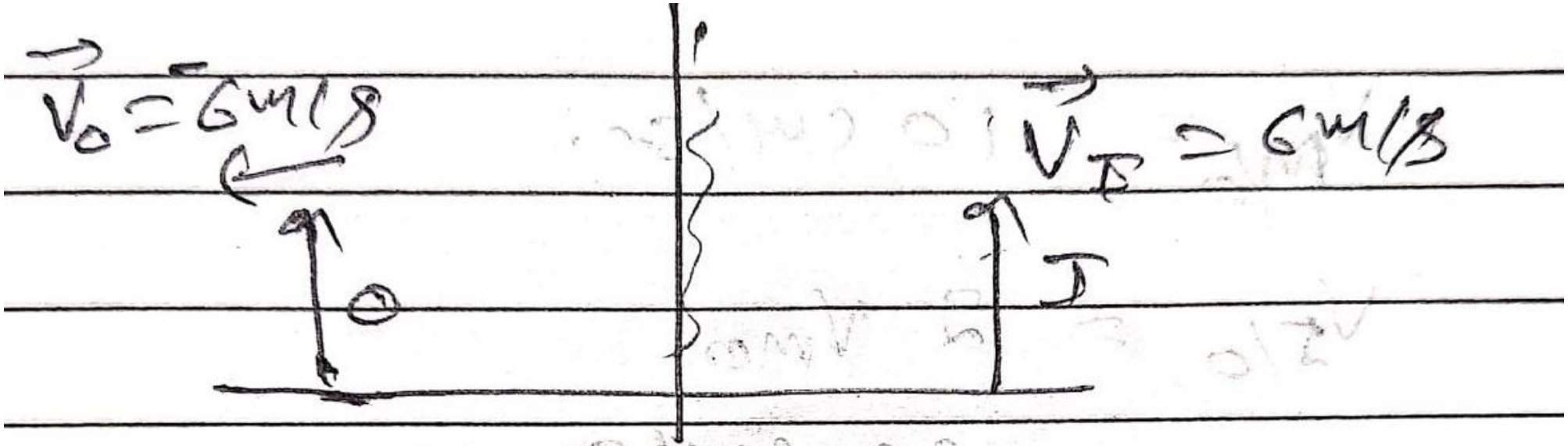
Ans. c



$$\vec{V_{I/O}} = \vec{V_I} - \vec{V_O}$$

$$= 6\,m/s + 6\,m/s$$

$$= 12\,m/s$$

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Q) A light ray is incident on a plane mirror at angle 30^0. If mirror is rotated by 10^0 then reflected ray is rotated by angle

(a) 30^0 (b) 10^0 (c) 20^0 (d) 60^0

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Ans. c

When mirror is

rotated by angle = θ

then Reflected Ray

is rotated by = 2θ

then $\theta = 10^{\circ}$

$2\theta = 20^{\circ}$

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Q) A light ray is incident on a horizontal plane mirror at an angle of 30^o with horizontal. At what angle with horizontal must a plane mirror be placed in its path so that it becomes vertically upwards after reflection?

(a) 30^0 (b) 10^0 (c) 20^0 (d) 60^0

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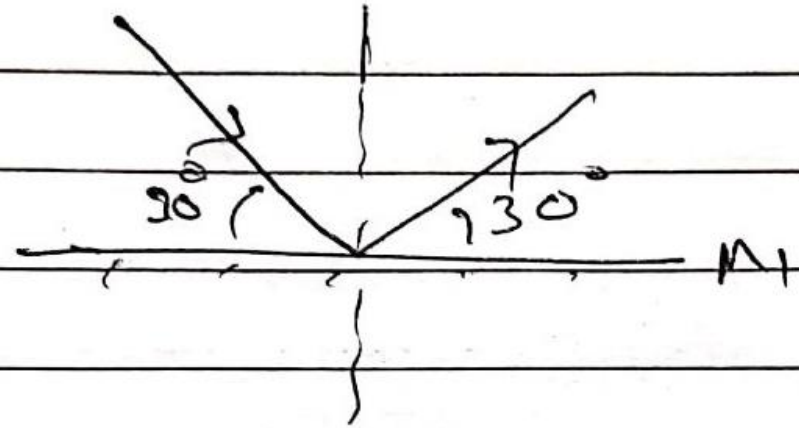
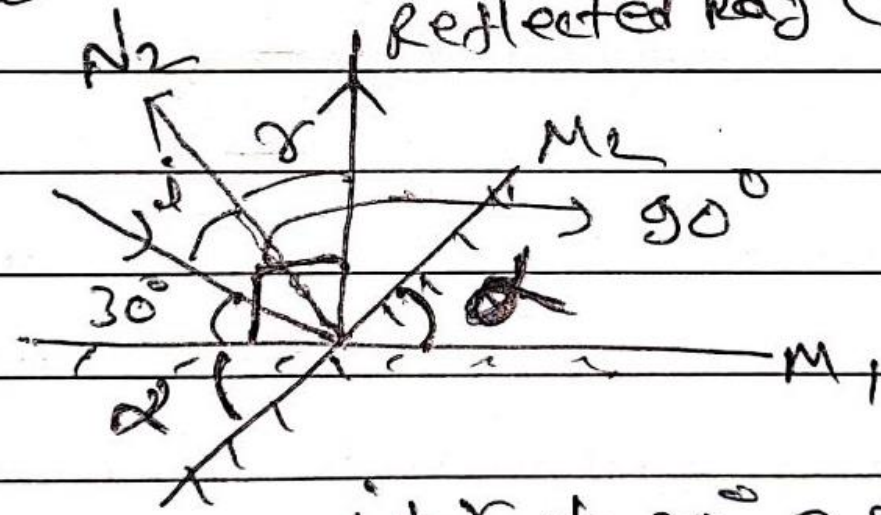
Ans. a



⇒ Now



Mirror

$i + \gamma + 30^\circ = 90^\circ$

$i + \gamma = 60^\circ$

$i = \gamma = 30^\circ$

Now

$\alpha + 30^\circ + i = 90^\circ$

$\boxed{\alpha = 30^\circ}$

Chalo Niklo