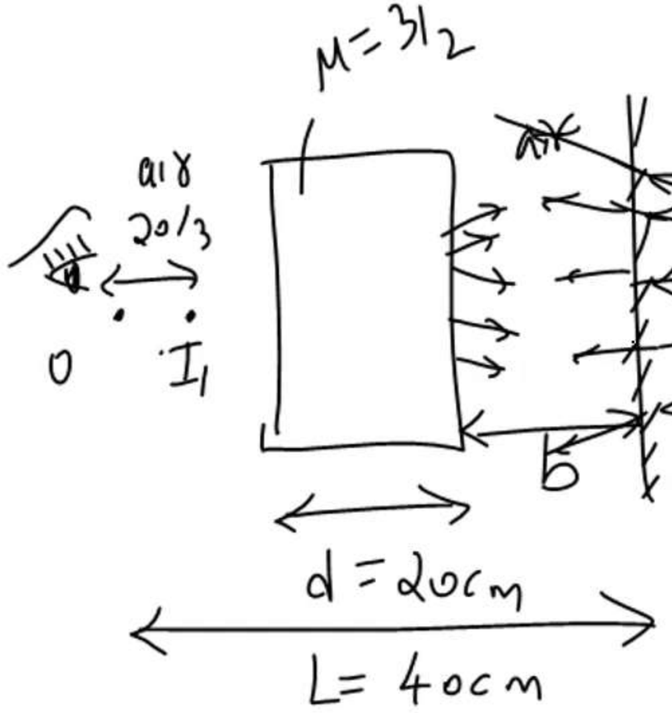
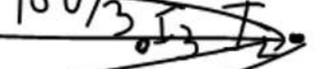
Ex 2.



Q. Find dist of img from observer.
nature of image?



x = Normal shift = $t\left(1-\frac{1}{\mu}\right)$

$= 20\left(1-\frac{1}{(3/2)}\right) = \frac{20}{3}$ cm

0 → real
I_1 → virtual.

I_1 will act as obj for mirror.

for mirror, I_1 → look like real obj.

I_2 → virtual image.

dist. of I_1 from mirror = $40-a = 40-\frac{20}{3} = \frac{100}{3}$ cm

-11- I_2 11 = 100/3 cm

I_2 will look like real obj for slab. @ dist =

shift in I_2 = 20/3 cm

I_3 will be @ 100/3 - 20/3 from mirror = 80/3 cm

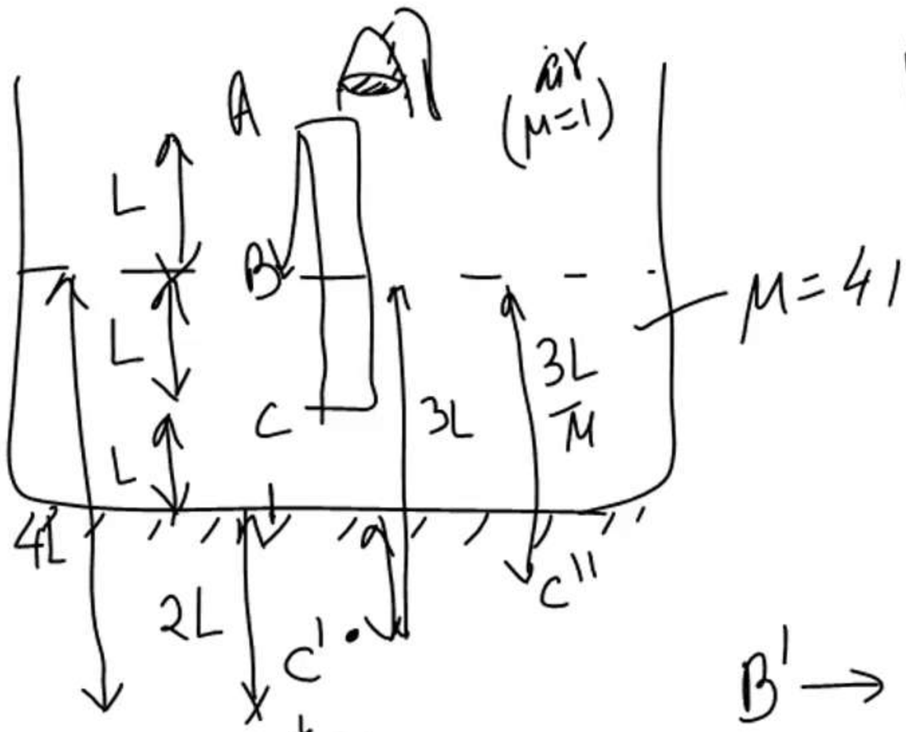
I_3 → final image

↳ @ $40\text{cm} + \frac{80}{3}$ cm

$= \frac{200}{3}$ cm from observer

↳ virtual

Ex 2.



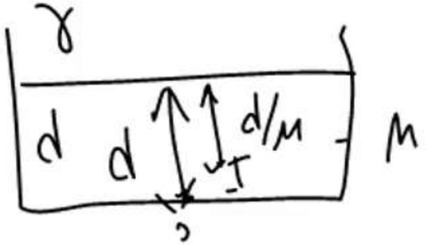
Find the length of image of rod?

(A). $\mu L + L$

(B). $L + L/\mu$

(C). $\mu L + L/\mu$

(D). None.



$I_A =$

$I_B = \frac{4L}{\mu} + L$

$I_C = \frac{3L}{\mu} + L$

$L' = A''B'' + B''C'' =$

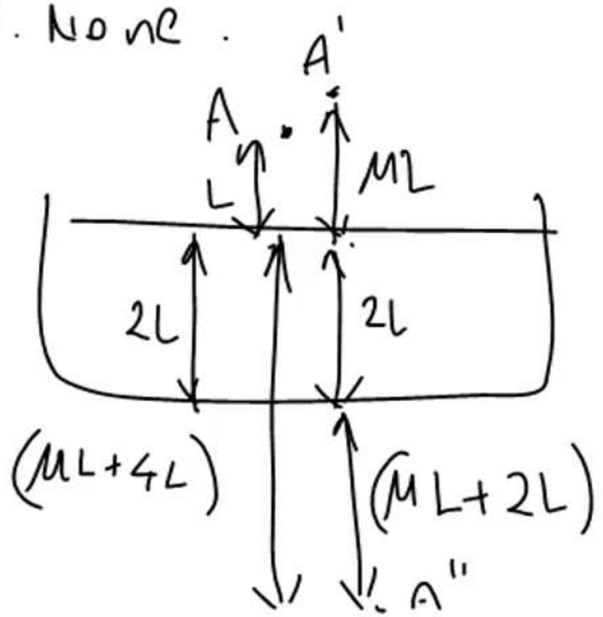
$= L + L/\mu$

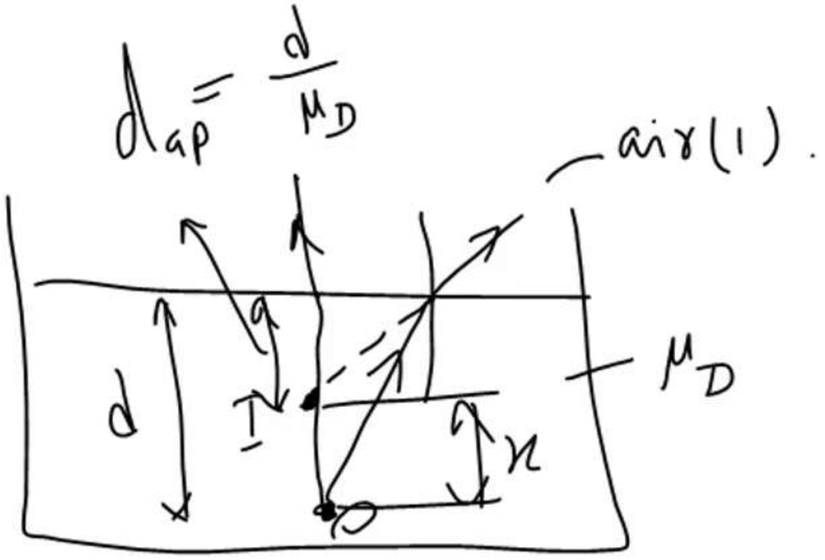
$B' \rightarrow$

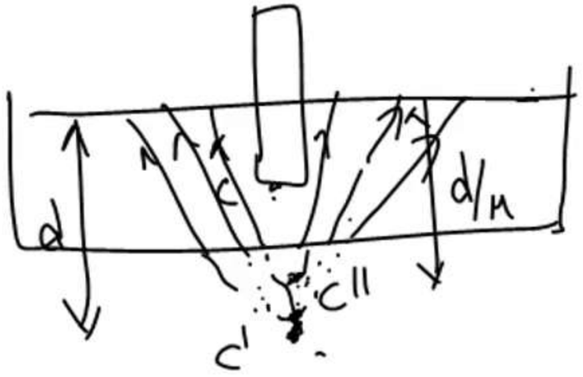
$I_A = \frac{(\mu L + 4L)}{\mu} + L$

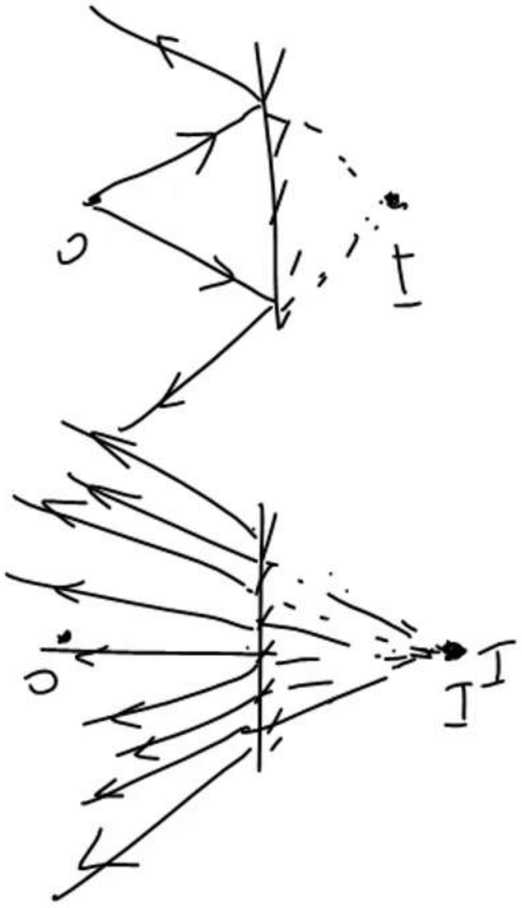
$A''B'' = L$

$B''C'' = L/\mu$

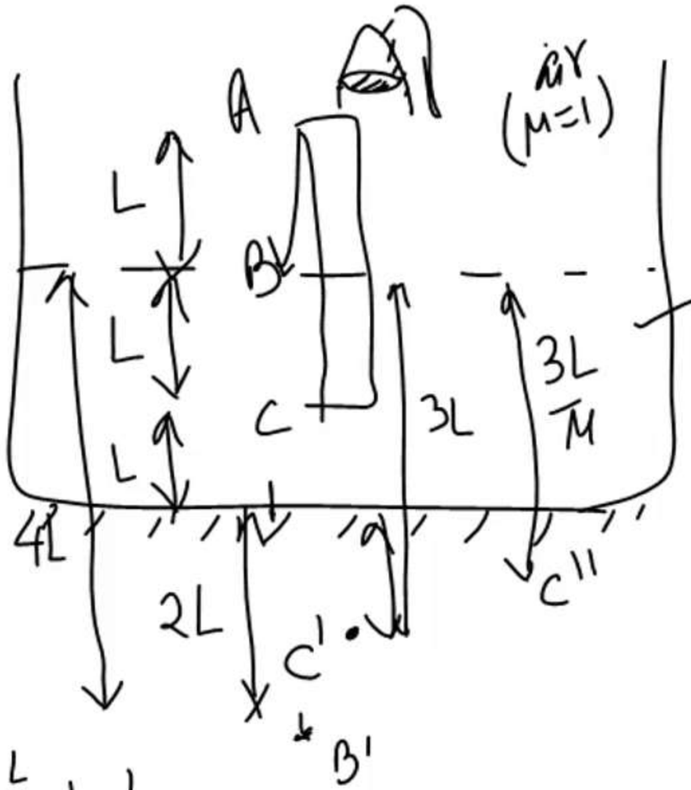



$d_{ap} = \frac{d}{\mu_D}$
air (1)
μ_D
d
I
x


d
C
C''
C'
d/μ


O
I
O
I
I

Ex 2.



$I_A =$

$I_B = \frac{4L}{\mu} + L$

$I_C = \frac{3L}{\mu} + L$

$B' \rightarrow$

$I_A = \frac{(\mu L + 4L)}{\mu} + L$

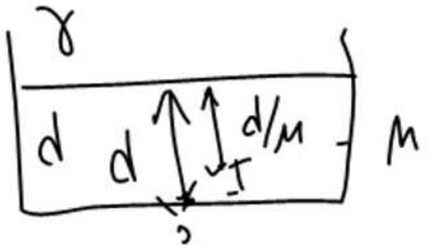
Find the length of image of rod?

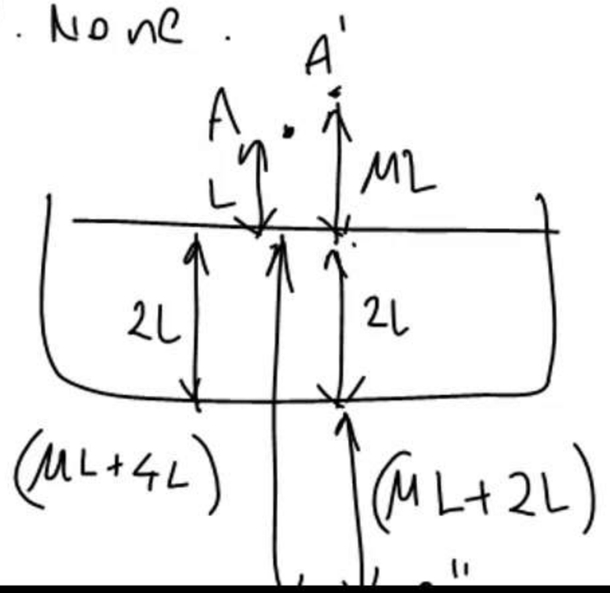
(A). $\mu L + L$

(B). $L + L/\mu$

(C). $\mu L + L/\mu$

(D). None.



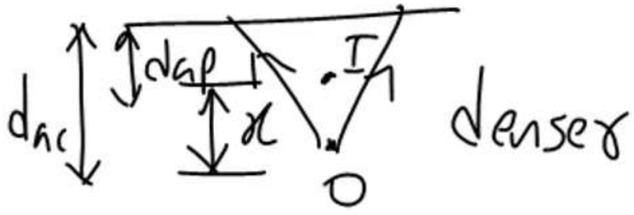


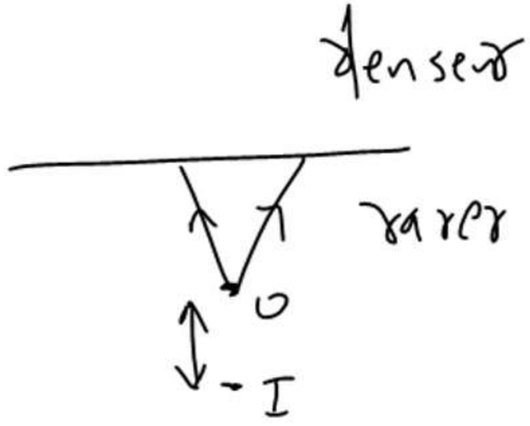
Refraction through plane surfaces →

$$d_{ap} = \frac{1}{\mu_{rel}} d_{ac}$$

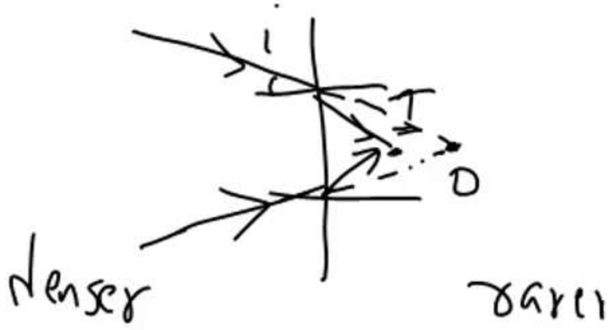
$$v = \frac{1}{\mu_{rel}} u$$

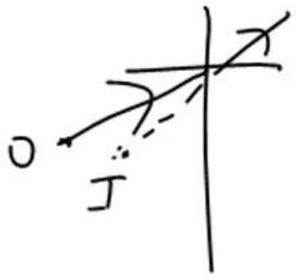
$$\frac{dv}{dt} = \frac{1}{\mu_{rel}} \frac{du}{dt}$$





Q. What will be the dirn of shift if the object is virtual in both the cases?





Q 10). A point source of light is place 4 m below the surface of water of refractive index 5/3. The minimum diameter of a disc which should be placed over the source on the surface of water to cut-off all light coming out of water is (μ = 5/3).

(1) 2 m

(2) 6 m

(3) 4 m

(4) 3 m

Q 9). Velocity of light in glass, whose refractive index w.r.t. air is 1.5, is 2×10^8 m/Sec. In a certain liquid the velocity of light is found to be 2.5×10^8 m/Sec. The refractive index of liquid w.r.t. air is.

(1) 0.64

(2) 0.80

(3) 1.20

(4) 1.44

$v_g = 2 \times 10^8$ m/s

$\mu_g = 1.5$

$v_g = c/\mu_g$

$v_l = 2.5 \times 10^8$ m/s

μ_l ?

$\mu_l = c/v_l = \frac{3 \times 10^8}{2.5 \times 10^8} = \frac{3}{5} \times 2 = \frac{6}{5} = 1.20$.

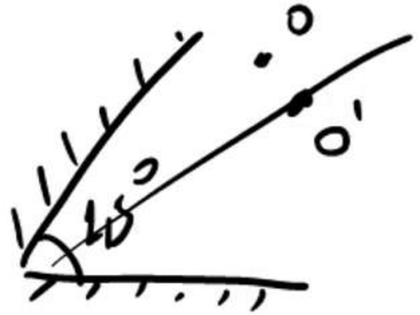
Q 8). Two plane mirrors are at 45^0 to each other. If an object is placed between them then the number of images will be.

(1) 5

(2) 9

(3) 7

(4) 8



no of images? $\rightarrow (m-1) = 7$

$m = \frac{360^\circ}{\theta} = \frac{360^\circ}{45^\circ} =$ 8 (even)

obj: position

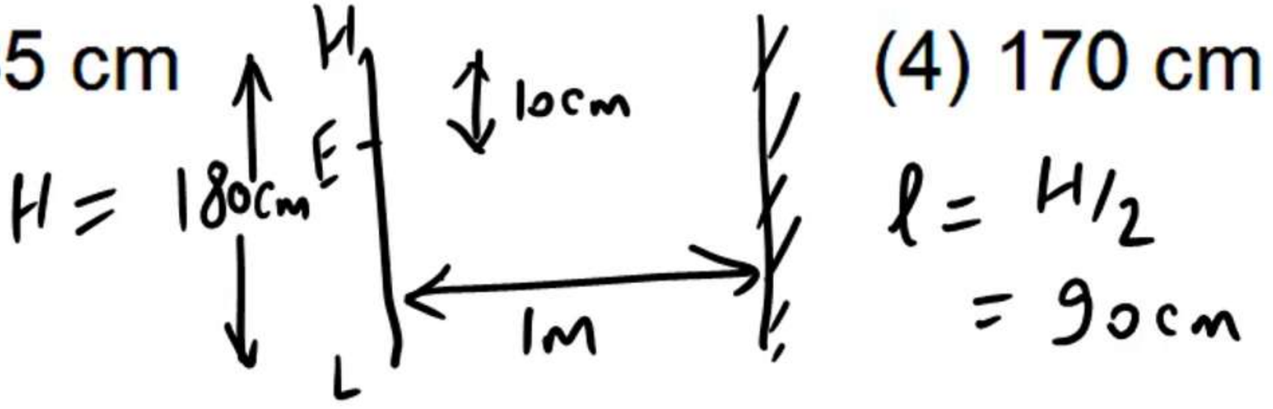
Q 7). A man is 180 cm tall and his eyes are 10 cm below the top of his head. In order to see his entire height right from toe to head, he uses a plane mirror kept at a distance of 1 m from him. The minimum length of the plane mirror required is.

(1) 180 cm

(2) 90 cm

(3) 85 cm

(4) 170 cm



$\ell = H/2$

$= 90\,cm$

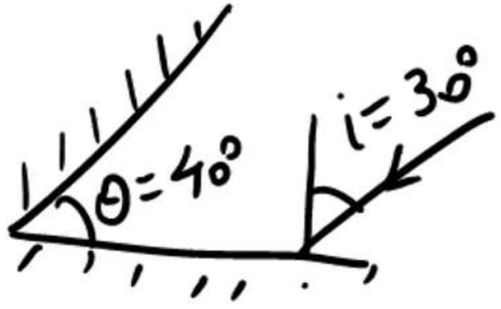
Q 6). A ray gets succesively reflection from two mirrors inclined at an angle of 40^0. If the angle of incidence on the first mirror is 30^0 then the net deviation of this ray after two reflections.

(1) 40^0

(2) 280^0

(3) 90^0

(4) 240^0



$\delta = 2\pi - 2\theta = 2(\pi - \theta)$

$= 2(180^\circ - 40^\circ) = 280^\circ$

$\delta = 2\pi - (2\pi - 2i) = 2i = 80^\circ$

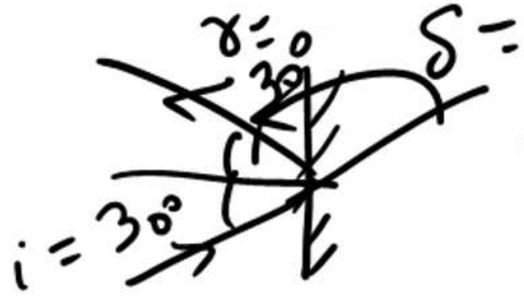
Q 5). A ray is incident at 30^0 angle on plane mirror. What will be deviation after reflection from mirror.

(1) 120^0

(2) 60^0

(3) 30^0

(4) 45^0



$\delta = \pi - 2i$

$= 180° - 2 \times 30$

$= 120°.$

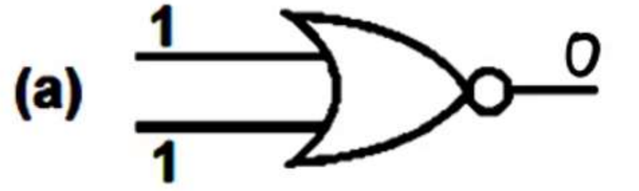
Q 4). Which of the following gates will have an output of 1 :-

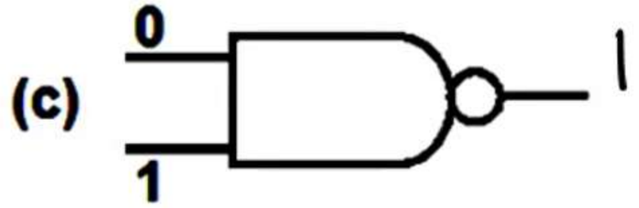
(1) (a) and (b)

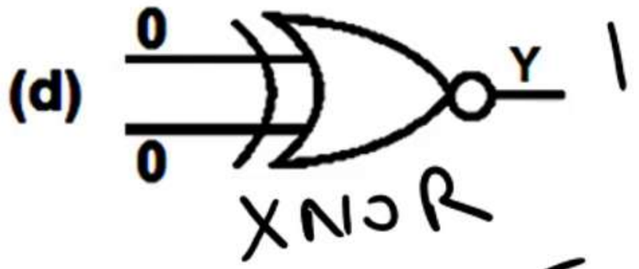
(2) (b) and (c)

(3) (c) and (d)

(4) (a) and (d)







XNOR

$y = A \cdot B + \bar{A} \cdot \bar{B}$

$= 1$

Q 3). Boolean algebra is essentially based on.

(1) Logic

(2) Truth

(3) Numbers

(4) Symbol

Q 2). The logic behind 'NOR' gate is that it gives :-

(1) High output when both inputs are high

(2) High output when both inputs are low

(3) Low output when both inputs are low

(4) None of these

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

Q 1). Out of the following which one is not a possible energy for a photon to be emitted by hydrogen atom according to Bohr's atomic model ?

(1) 0.65 eV

(2) 1.9 eV

(3) 11.1 eV

(4) 13.6 eV