



PHYSICS

BOOKS - SELINA PHYSICS (ENGLISH)

QUESTION PAPER 2022 TERM 1

Multiple Choice Questions

1. The deviation produced by an equilateral prism does not depend on:

- A. the angle of incidence
- B. the size of the prism
- C. the material of the prism
- D. the colour of light used

Answer:



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2. The refractive index of a diamond is 2.4. It means that:

A. the speed of light in vacuum is equal to

$\frac{1}{2.4}$ times the speed of light in diamond

B. the speed of light in the diamond is 2.4

times the speed of light in a vacuum.

C. the speed of light in a vacuum is 2.4

times the speed of light in the diamond.

D. the wavelength of light in diamond is 2.4

times the wavelength of light in vacuum.

Answer:



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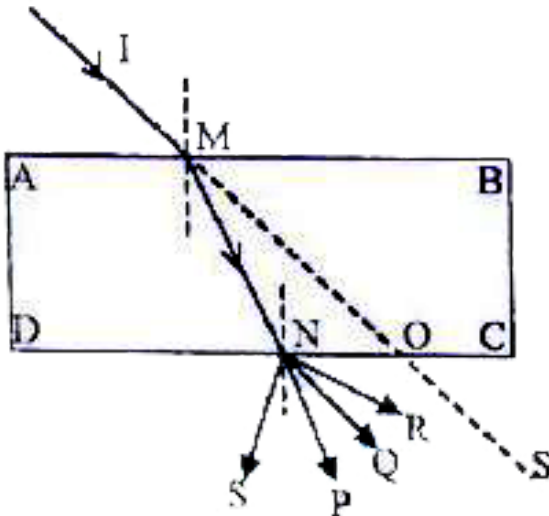
3. An object of height 10 cm is placed in front of a concave lens of focal length 20 cm at a distance 25 cm from the lens. Is it possible to capture this image on a screen? Select a correct option from the following:

- A. Yes, as the image formed will be real.
- B. Yes, as the image formed will be erect.
- C. No, as the image formed will be virtual.
- D. No, as the image formed will be inverted.

Answer:

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4. A ray of light IM is incident on a glass slab $ABCD$ as shown in the figure below. The emergent ray for this incident ray is :



A. NQ

B. NR

C. NP

D. NS

Answer:



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5. Name the colour of white light which is deviated (i) the most, and (ii) the least, on passing through a prism.

A. green

B. yellow

C. red

D. violet

Answer:



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6. The wavelength range of white light is :

A. 40 nm to 80 nm

B. 4000 nm to 8000 nm

C. 4 nm to 8 nm

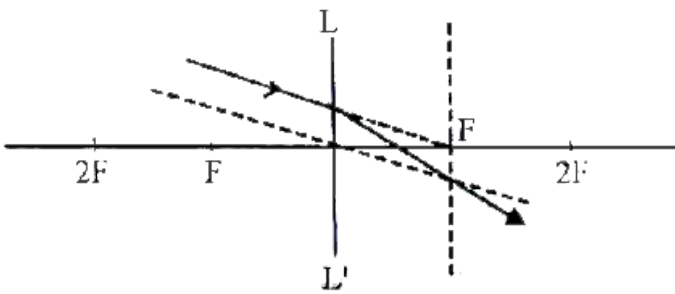
D. 400 nm to 800 nm

Answer:



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7. Observe the diagram which shows the path of an incident ray through an optical plane LL' of a lens . The focal length of the lens is 20 cm .



If an object is placed at a distance of 30cm in front of his lens , then :

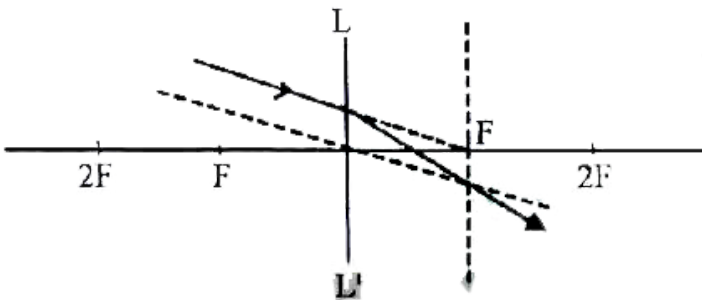
- A. the image will be virtual
- B. the image will be diminished and inverted
- C. the image will be diminished
- D. the image will be real and magnified.

Answer:



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8. Observe the diagram which shows the path of an incident ray through an optical plane LL' of a lens. The focal length of the lens is 20 cm



This type of lens can be used :

A. to correct hypermetropia

B. to correct myopia

C. to diverge light .

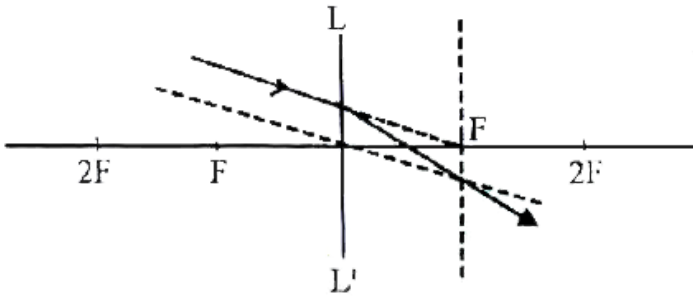
D. in the front door peepholes.

Answer:



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9. Observe the diagram which shows the path of an incident ray through an optical plane LL' of a lens . The focal length of the lens is 20 cm



An object is placed in front of his lens at a distance of 60 cm . Then the image distance from the lens with proper sign convention is :

A. $+60cm$

B. $+30cm$

C. $-30cm$

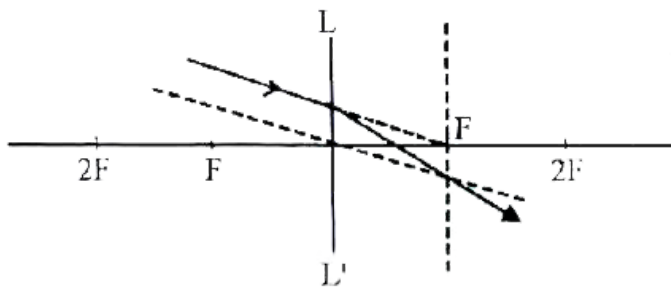
D. $+15cm$

Answer:



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10. Observe the diagram which shows the path of an incident ray through an optical plane LL' of a lens. The focal length of the lens is 20 cm



An object is placed in front of this lens at a

distance of 60 cm . Then the magnification of the image is :

A. 0.25

B. 1.25

C. -0.5

D. 1

Answer:



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11. Write the relationship between the SI and CGS unit of moment of force.

A. $1Nm = 10^5 \text{ dyne cm}$

B. $1Nm = 10^5 \text{ dyne}$

C. $1Nm = 10^7 \text{ dyne cm}$

D. $1\text{dyne cm} = 10^7 \text{ N m}$

Answer:



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12. A coolie raises a load upwards against the force of gravity then the work done by the load is :

A. zero

B. positive work

C. negative work

D. none of these

Answer:



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13. The energy change during photosynthesis in plants is :

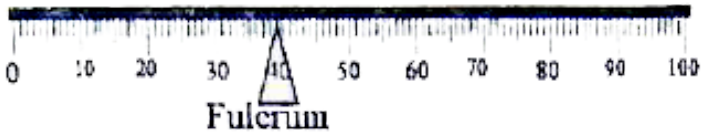
- A. heat to chemical
- B. light to chemical
- C. chemical to light
- D. chemical to heat.

Answer:

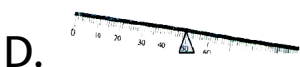
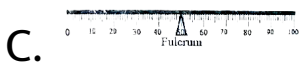
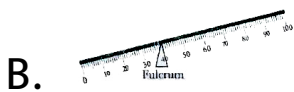
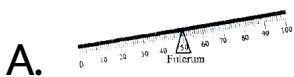


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14. The diagram below shows the balanced position of a meter scale



Which one of the following diagrams shows the correct position of the scale when it is supported at the centre ?



Answer:



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15. A stone tied at the end of a string is whirled by hand in a horizontal circle with uniform speed

Name the force required for this circular motion

A. Centrifugal force

B. Centripetal force

C. Force of gravity

D. Functional force

Answer:



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16. A stone bed at the end of a string is whirled by hand in a horizontal up with uniform speed

What is the direction of the above-mentioned force ?

- A. Towards the centre of the circular path
- B. Away from the centre of the circular path
- C. Normal to the radius at a point where the body is present on the circular path
- D. Direction of this force keeps on changing alternately towards and away from the centre

Answer:



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17. A body of mass 200 g falls freely from a height of 15 m [$g = 10 \text{ m s}^{-2}$]

When the body reaches 10 m above the ground, its potential energy will be

A. 20000 J

B. 10 J

C. 10000 KJ

D. 20 J

Answer:



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18. A body of mass 200 g falls freely from a height of 15 m [$g = 10 \text{ m s}^{-2}$]

The gain in kinetic energy of the body when it reaches 10 m above the ground .

A. 20 J

B. 10 J

C. 30 J

D. 25 J

Answer:



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19. A body of mass 200 g falls freely from a height of 15 m [$g = 10 \text{ ms}^{-2}$]

The total mechanical energy it will possess , when it is just about at strike the ground is :

A. 30000J

B. 20000 J

C. 30 J

D. 20 J

Answer:



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20. A body of mass 200 g falls freely from a height of 15 m [$g = 10 \text{ ms}^{-2}$]

The velocity in ms^{-1} with which the body will hit the ground is :

A. 30

B. 10

C. $10\sqrt{3}$

D. $10\sqrt{2}$

Answer:



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21. A woman draws water from a well using a fixed pulley . The mass of the bucket and the water together is 10 kg . The force applied

by the woman is 200 N . The mechanical advantage is ($g = 10m / s^2$)

A. 2

B. 20

C. 0.05

D. 0.5

Answer:



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22. A single fixed pulley is used because :

A. it change the direction of applied effort conveniently.

B. it multiplies speed

C. it multiplies effort

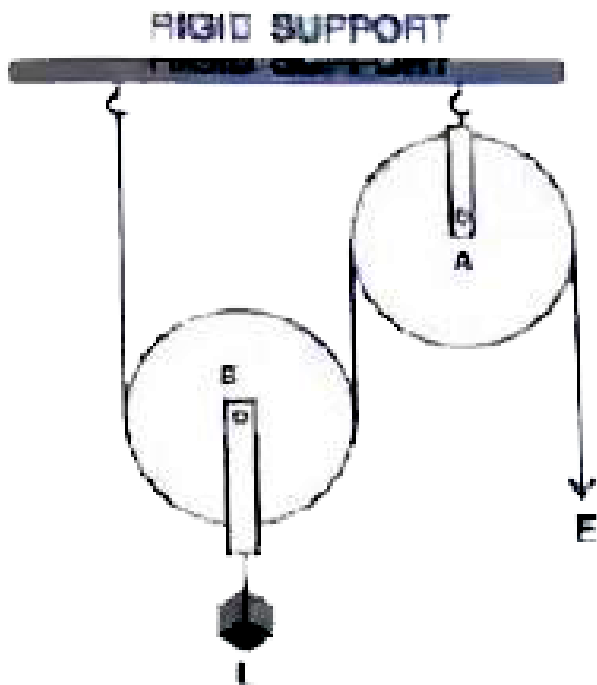
D. its efficiency is 100%

Answer:



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23. In the diagram shown below , the velocity ratio of the arrangement is



A. 1

B. 2

C. 3

D. 4

Answer:



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24. Which one of the following is the correct mathematical relation ?

A. $\text{Power} = \text{Force}/\text{Velocity}$

B. $\text{Power} = \text{Force} \times \text{Acceleration}$

C. $\text{Power} = \text{Force}/\text{Acceleration}$

$$D. \text{ Power} = \text{Force} \times \text{Velocity}$$

Answer:



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25. Select a correct option with respect to echo depth sounding :

A. infrasonic waves are used

B. the frequency of the waves used is between 20 Hz and 20,000 Hz.

C. ultrasonic waves are used.

D. supersonic waves are used.

Answer:



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26. Which one of the following diagnostic methods use reflection of sound ?

A. CT scan

B. Electrocardiogram

C. Echo cardiogram

D. MRI

Answer:



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27. A boy standing in front of a wall produces two whistles per second. He notices that the sound of his whistling coincides with the echo. The echo is heard only once when whistling is stopped. Calculate the distance between the

boy and the wall. (The speed of sound in air = 320 m/s)

The time in which the boy hears the echo is

A. 1 s

B. 0.5 s

C. 1.5 s

D. 2s

Answer:



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28. A boy standing in front of a wall produces two whistles per second. He notices that the sound of his whistling coincides with the echo. The echo is heard only once when whistling is stopped. Calculate the distance between the boy and the wall. (The speed of sound in air = 320 m/s)

The distance at which the boy is standing from the wall :

A. 160 m

B. 240 m

C. 320 m

D. 80 m

Answer:



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29. A boy standing in front of a wall produces two whistles per second. He notices that the sound of his whistling coincides with the echo. The echo is heard only once when whistling is stopped. Calculate the distance between the

boy and the wall. (The speed of sound in air = 320 m/s)

If the speed of sound is increased by 16ms^{-1} and the boy moves 4 m away from the wall then in how much time will he hear the echo of the first whistle ?

A. 0.525 s

B. 0.5s

C. 0.48s

D. 0.3s

Answer:



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30. A boy standing in front of a wall produces two whistles per second. He notices that the sound of his whistling coincides with the echo. The echo is heard only once when whistling is stopped. Calculate the distance between the boy and the wall. (The speed of sound in air = 320 m/s)

In which of the following timings of reflection of the whistle the echo cannot be heard ?

A. 0.05s

B. 0.12 s

C. 0.2 s

D. 0.11 s

Answer:



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31. The ratio of velocities of light of wavelength 400 nm and 800 nm in a vacuum is

A. 1 : 1

B. 1 : 2

C. 2 : 1

D. 1 : 3

Answer:



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32. 1 joule = erg

A. 10^9

B. 10^7

C. 10^5

D. 10^6

Answer:



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33. Assertion : A light body and a heavy body have same momentum. Then they also have same kinetic energy

Reason: Kinetic energy does not depend on mass of the body

A. kinetic energy of body A and body b will be the same

B. kinetic energy of body A is greater than kinetic energy of body B

C. kinetic energy of body B is greater than kinetic energy of body A

D. unless we know the velocity , we cannot find which body has greater kinetic

energy .

Answer:



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34. If the ratio of kinetic energies of A and B is 5:2 then which one of the following gives the mass ratio of the bodies respectively ?

A. 5 : 2

B. 25 : 4

C. 2: 5

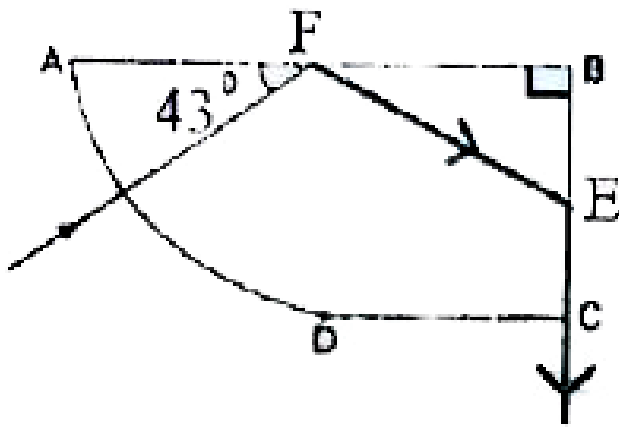
D. 4: 24

Answer:



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35. The diagram below shows a ray of light travelling from air into a glass materials as shown below.



The angle of incidence at the surface AB is :

A. 43°

B. 47°

C. 90°

D. 0°

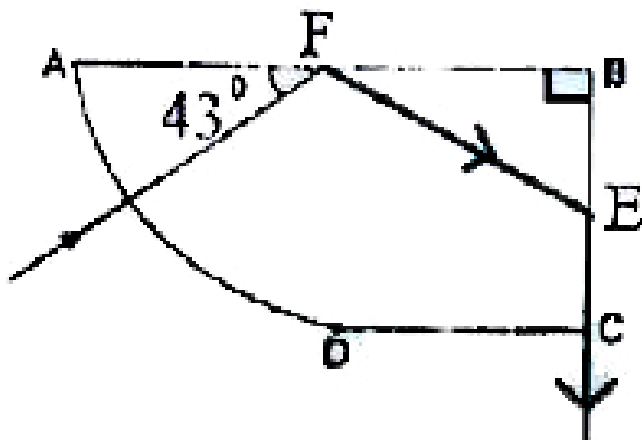
Answer:





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36. The diagram below shows a ray of light travelling from air into a glass materials as shown below.



Select a correct statement from the following.

A. The speed of light at the curved surface

AD does not change while entering the

block

B. The ray at the surface AD is not

travelling along the radius of the curved

part.

C. The ray at the surface AD is travelling

along the radius of the curved part.

D. Light never refracts when it enters a

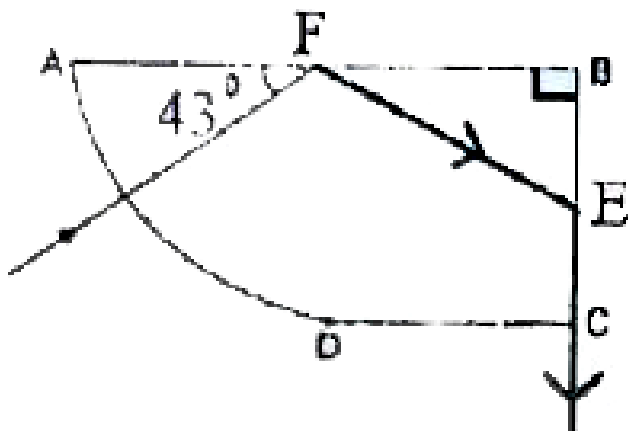
curved surface.

Answer:



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37. The diagram below shows a ray of light travelling from air into a glass materials as shown below.



The angle of incidence on the surface BC is

A. 43°

B. 47°

C. 90°

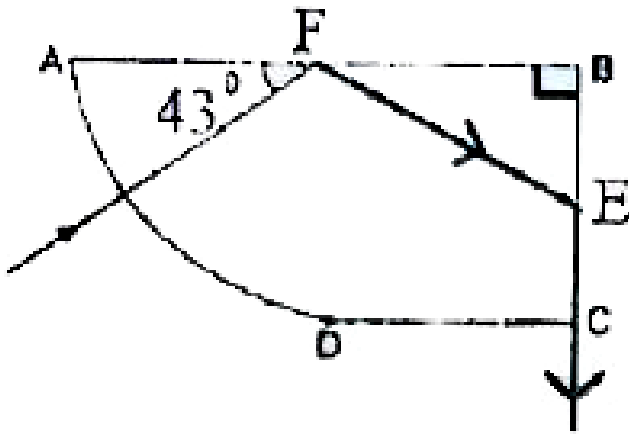
D. 0°

Answer:



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38. The diagram below shows a ray of light travelling from air into a glass materials as shown below.



The critical angle of this material of glass :

A. 47°

B. 43°

C. 42°

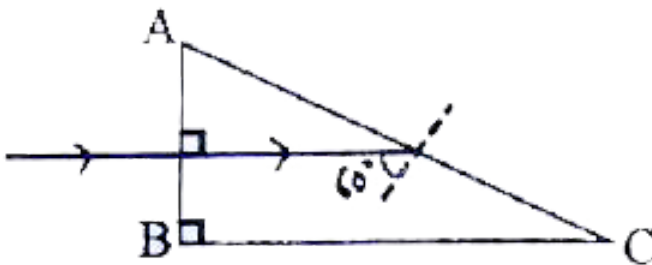
D. 45°

Answer:



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39. The diagram below shows the path of light passing through a right-angled prism of critical angle 42°



The angle C of the prism is :

A. 45°

B. 60°

C. 90°

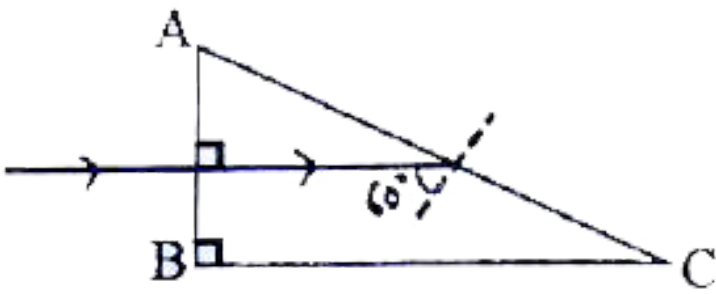
D. 30°

Answer:

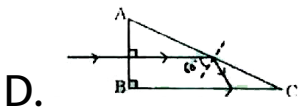
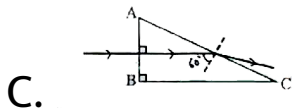
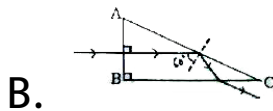
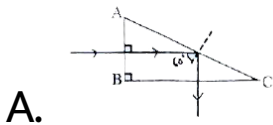


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40. The diagram below shows the path of light passing through a right-angled prism of critical angle 42°



Which one of the following diagrams shows the correct path of this ray till it emerges out of the prism ?



Answer:



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