

Answer on Question #51839-Physics-Optics

11 Refraction is a measure of the ----- as a wave passes from medium to another

- a) velocity b) frequency c) wave front d) displacement

Solution

Refraction is the change in direction of a wave due to a change in its transmission medium. Because of change of medium, the phase velocity of the wave is changed but its frequency remains the same. This phenomenon is mostly observed when light passes from one medium to another. Refraction can be described by Snell's law, which reads

$$n_1 \sin \theta_1 = n_2 \sin \theta_2,$$

where v_1, v_2 are the phase velocities in the two media, θ_1 is the angle of incidence, θ_2 is the angle of refraction. Therefore, we can state that the correct answer is velocity.

Answer: a) velocity.

12 The image of an object is found to be upright and reduced in size. What type of mirror is used to produce such an image?

- a) Concave b) Convex c) Both mirrors d) None of the above

Solution

If the object is closer than the focal length, a *concave mirror* will form a virtual, upright image.

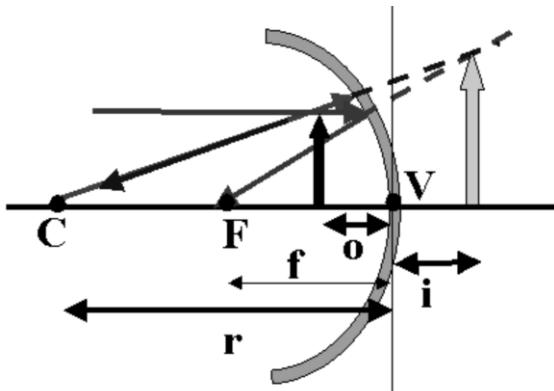


Image is larger and upright.

If the object is outside the focal length, a *concave mirror* will form a real, inverted image.

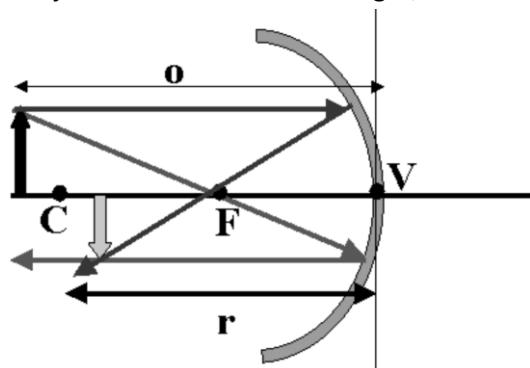
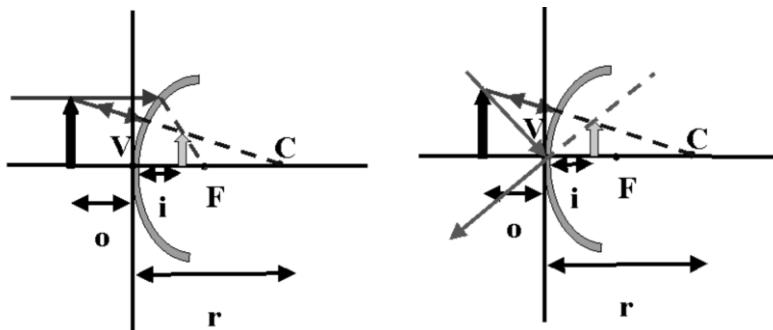


Image is real, inverted and smaller.

But, for the convex mirror the image is always virtual, upright and it is smaller than the object.



Answer: b) Convex.

13 Convex mirrors are mostly used as?

- a) magnifying glasses b) driving mirrors c) dentist mirrors d) artist mirrors

Solution

The image formed by a convex mirror is always situated between the pole and the focus, irrespective of the position of the object in front of mirror. Therefore:

1. It is used as rear view mirror in automobiles. This is due to the reason that a convex mirror provides a wider field of view than a plane or concave mirror.
2. It is used as reflector in street lamps so as to diverge light over a large area.
3. It is used as security mirror in shops and on roads at sharp bends and concealed entrances.

Answer: b) driving mirrors.

14 Which of the following is NOT true of experiments involving curved mirrors?

- a) image distance is negative for real image b) object distance is positive c) image distance is negative for virtual image d) focal length is negative for convex mirrors

Solution

The mirror equation assumed that image distance is negative when it is virtual image. Therefore, for experiments involving curved mirrors image distance is negative for virtual image but not for real image.

Answer: a) image distance is negative for real image.

15 Which of the following is NOT applicable when plotting the graph of experimental data?

- a) Lines of best fit should always be used b) circled dots or crosses may be used to show plotted points c) thin, sharp and continuous lines are acceptable d) the scale must be chosen to make the graph occupy as small as possible of the graph page.

Solution

The scale must be chosen to make the graph occupy as small as possible of the graph page is NOT applicable, because it is better the graph to occupy whole the graph page, that makes it more clear and easy to apprehend.

Answer: d) the scale must be chosen to make the graph occupy as small as possible of the graph page.

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