Answer on Question #61979-Physics-Optics

13 In practical experiment involving the use of optical pins, parallax is reduced or removed if on slightly displacing one's eye from side to side.

the object and image are not coincident but move together in same directions

the object and image move in opposite directions relative to each other

the object and image are coincident and move together in the same direction

the object and image are coincident and remain stationary

Answer

The object and image are not coincident but move together in same directions.

14 In an experiment with a concave mirror, the image of an optical pin which is 4 times its size was cast on a screen 6m from the object pin. How far from the object pin should the mirror be placed?

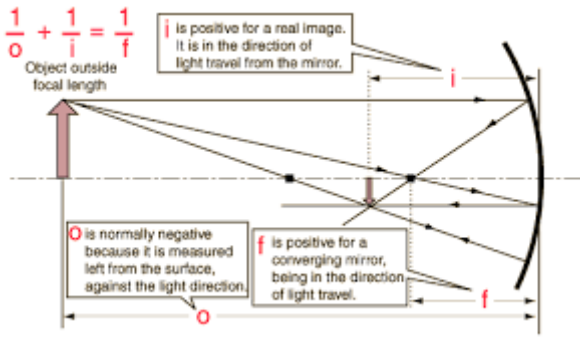
8m

6m

3m

2m

Solution



The magnification of a mirror is defined as the height of the image divided by the height of the object:

$$m = \frac{h_i}{h_o} = \frac{i}{o},$$

where $o - i = 6m$.

Thus,

$$\frac{1}{4} = \frac{o - 6m}{o}$$

The object position is

$$o = \frac{24\text{m}}{3} = 8\,m.$$

Answer: 8m.

15 The image of an object which is between the concave mirror's reflecting surface and its principal focus is

in front of the mirror erect real and diminished

behind the mirror inverted real and diminished

in front of the mirror erect virtual and enlarged

behind the mirror erect virtual and enlarged

Answer

When the Object is between the Pole and the Focus:

Consider a ray of light which is parallel to the incident ray and another ray which is passing through the center of curvature. The ray which is passing through the center of curvature retraces its path and the other ray which is parallel to the principal axis after reflection passes through the focus. These rays appear to meet behind the mirror when the reflected rays are extended backwards. **The image is virtual, erect and magnified.**