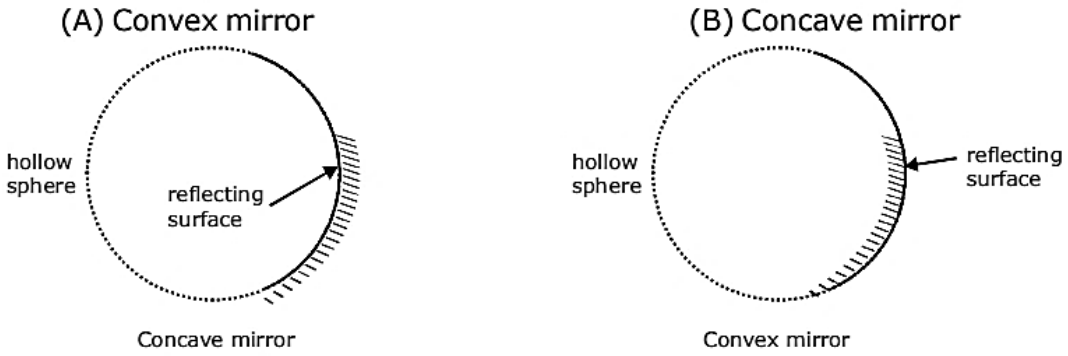
SCIENCE

REFLECTION FROM SPHERICAL MIRROR

Spherical mirror : A mirror whose polished, reflecting surface is a part of hollow sphere of glass is called a spherical mirror. For a spherical mirror, one of the two curved surfaces is coated with a thin layer of silver followed by a coating of red lead oxide paint. Thus one side of the spherical mirror is made opaque and the other side acts as a reflecting surface. For the polishing side there are two type of spherical mirror.



(A) Concave (Converging) mirror : A spherical mirror whose inner hollow surface is the reflecting surface.

(B) Convex (diverging) mirror : A spherical mirror whose outer bulging out surface is the reflecting surface.

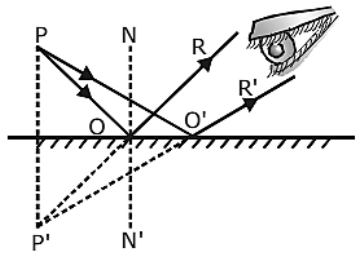
❖ FORMATION OF IMAGE IN A PLANE MIRROR P

is an object which is placed in front of a plane mirror AB as shown in fig. Rays PO and PO' starting from P falls on mirror then these rays are reflected in OR and O'R' directions respectively. When the reflected rays enter the eye then they appear to diverge from P'. P' is called the image of object P. Following are the properties of the image formed by a plane mirror

(i) Image is always virtual

(ii) Image lies as far behind the mirror as the object is infront of it.

(iii) The size of image is the same as the object. The only difference is that the right side of an object appears to be left in the image and vice versa. This effect is known as lateral inversion. Lateral inversion is shown in fig.

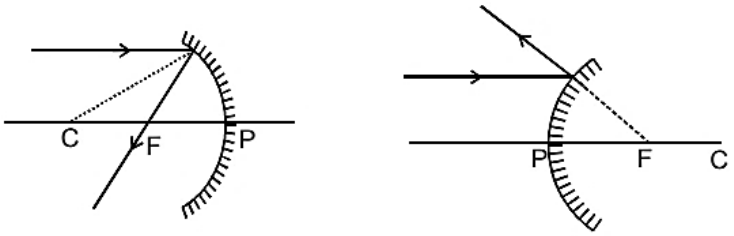


Reflection by plane mirror

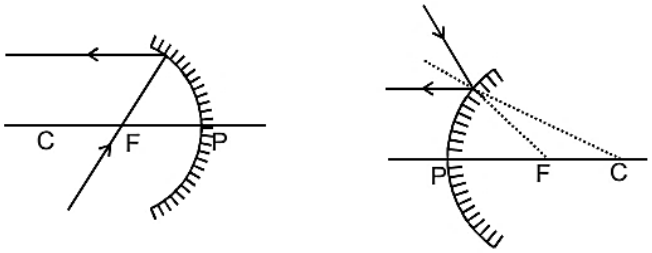
RULES FOR IMAGE FORMATION

The reflection of light rays and formation of images are shown with the help of ray diagrams. Some typical incident rays and the corresponding reflected rays are shown below.

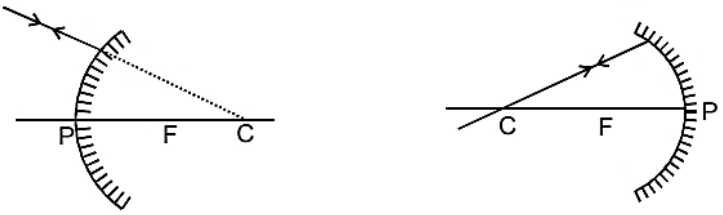
(i) A ray passing parallel to the principal axis, after reflection from the spherical mirror passes or appears to pass through its focus (by the definition of focus)



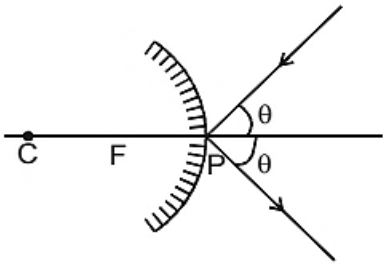
(ii) A ray passing through or directed towards focus, after reflection from the spherical mirror becomes parallel to the principal axis (by the principal of reversibility of light).



(iii) A ray passing through or directed towards the centre of curvature, after reflection from the spherical mirror, retraces its path (as for it $\angle i = 0$ and so $\angle r = 0$)



(iv) It is easy to make the ray tracing of a ray incident at the pole as shown in below.



Use of Concave mirror

(i) It is used as a shaving mirror.

(ii) It is used as a reflector in the head light of vehicles.

(iii) It is used by doctor to focus a parallel beam of light on a small area.

Uses of Convex mirror

(i) It is used as a rear view mirror in automobile.

(ii) It is used as a reflector for street light.

Note : A plane mirror is not useful as a rear view mirror, because its field of view is very small.