

Various terms Associated with Spherical Mirrors:

Spherical Mirror:

A curved mirror formed by a part of a hollow glass sphere with a reflecting surface or polished surface is referred as a Spherical mirror.

Concave Mirror:

A concave mirror is a curved mirror with the reflecting surface on the hollow side.

Convex Mirror:

A convex mirror is a curved mirror with the reflecting surface on the outer side

Centre of Curvature:

The centre of curvature of a curved mirror is defined as the center of the hollow glass sphere of which the curved mirror is a part.

Radius of Curvature:

The radius of curvature of a curved mirror is defined as the radius of the hollow glass sphere of which the spherical mirror is a part.

The line drawn from the center of curvature C to the mirror surface meets it at right angle and equals the radius of curvature.

Principal Axis:

The principal axis of a curved mirror is defined as the imaginary line passing through its pole P and center of curvature C.

Principal Focus:

Concave mirror:

The point on the principal axis where the light rays traveling parallel to the principal axis after reflection from a concave mirror actually meet or converge to a point which is called as principal focus of the concave mirror. It lies in front of the concave mirror on principal axis.

Convex mirror:

The light rays traveling parallel to the principal axis after reflection from a convex mirror appear to diverge from a point which is called as principal focus of the convex mirror. It lies behind the mirror.

Focal length

The focal length of a spherical mirror is the distance between the pole P and the Principal focus F of a curved mirror

Relation between focal length & radius of curvature of spherical mirror:

The focal length of spherical mirror is half the radius of curvature.

Focal Length = Radius of Curvature / 2

Pole:

The pole is defined as the geometric center of the curved or spherical mirror. OR Center of the spherical mirror is called Pole.

Rules of Reflection for Curved Mirrors:

- Any light ray traveling parallel to the principal axis is reflected by the curved mirror through the principal focus.

- It either actually passes (for a concave mirror) or appears to pass (for a convex mirror) through the principal focus.
- Any light ray that passes (for a concave mirror) or appears to pass (for a convex mirror) through the principal focus is reflected by the curved mirror parallel to the Principal axis
- Any light ray that passes (for a concave mirror) or appears to pass (for a convex mirror) through the center of curvature retraces its initial path after reflection by the curved mirror.

Characteristics of the Images Formed by a Concave mirror:

When the object is at infinity: (In the case of a concave mirror)

The image formed has the following properties.

1. The image is real.
2. The image is inverted.
3. The image is highly diminished to a point.
4. The image is formed at the principal focus in front of the concave mirror.

When the object is between infinity and the center of curvature: (In front of a concave mirror)

The image formed has the following properties.

1. The image is real.
2. The image is inverted.
3. The image is diminished.
4. The image is formed between the principal focus and the center of curvature in front of the concave mirror.

When the object is placed at the principal focus:
(In front of a concave mirror)

The image formed has the following properties.

1. The image is real.
2. The image is inverted.
3. The image is highly enlarged.
4. The image is formed at infinity in front of the concave mirror.

When the object is placed between the pole and the principal focus in front of a concave mirror:

The image formed has the following properties.

1. The image is Virtual.
2. The image is erect.
3. The image is enlarged.
4. The image is formed behind the concave mirror.

When the object is placed between the principal focus and the center of curvature in front of a concave mirror:

The image formed has the following properties.

1. The image is real.
2. The image is inverted.
3. The image is enlarged.
4. The image is formed beyond the center of curvature in front of the concave mirror but not at infinity.

When the object is placed at the center of curvature in front of a concave mirror:

The image formed has the following properties.

1. The image is real.
2. The image is inverted.
3. The image is of the same size as the object.
4. The image is formed at the center of curvature in front of the concave mirror.

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