

Sharjah Indian School – Boys Wing

Practicals for class X

Experiment No: 1

Concave mirror

Aim:-

To determine the focal length of a concave mirror by focusing a distant object.

Apparatus:-

A concave mirror, mirror stand, screen and a metre scale.

Theory:-

When the object is at infinity, the light rays from each point of the object reaches the mirror in the form of a beam of parallel rays and the mirror forms the image at its focal plane.

Procedure:-

1. Locate a distant object from the window of your laboratory.
2. Place the mirror on a mirror stand and adjust its position such that it comes in line with the object.

3. Place a screen in front of the mirror and adjust its position so that a sharp inverted diminished image is formed on it.
4. Record the distance between the position of the mirror and the screen. This is equal to the focal length of the mirror.
5. Repeat the experiment for different objects.
6. Calculate the average focal length from the data.

Precautions:-

1. Fix the concave mirror vertically in the holder.
2. The mirror stand and the screen should be in line with the scale.
3. Record the position of the screen only when a sharp image is formed.

Result:-

The focal length of the concave mirror =

Experiment No: 2

Convex lens

Aim:-

To determine the focal length of a convex lens by focusing a distant object.

Apparatus:-

A convex lens, lens stand, screen and a metre scale.

Theory:-

When the object is at infinity, the light rays from each point of the object reach the lens in the form of a beam of parallel rays and the lens forms the image in its focal plane.

Procedure:-

1. Locate a distant object from the window of your laboratory.
2. Place the lens on a lens stand and adjust its position such that it comes in line with the object.
3. Place a screen behind the lens and adjust its position so that a sharp inverted diminished image is formed on it.
4. Record the distance between the position of the lens and the screen. This is equal to the focal length of the lens.
5. Repeat the experiment for different objects.

6. Calculate the average focal length from the data.

Precautions:-

1. Fix the convex lens vertically in the holder.
2. The lens stand and the screen should be in line with the scale.
3. Record the position of the screen only when a sharp image is formed.

Result:-

The focal length of the convex lens =

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Experiment: 3

Refraction through a rectangular glass slab

Aim:-

To trace the path of a ray of light passing through a rectangular glass slab and to measure the angle of incidence, angle of refraction, angle of emergence and the lateral shift and hence to interpret the result.

Apparatus:-

Drawing board, pins, white sheet of paper, rectangular glass slab, pencil, etc.

Procedure:-

Fix the paper on a drawing board. Place the glass slab on the paper and draw around the boundary. Draw a normal to one side near the left end and measure the angle of incidence as 30° . Draw the incident ray and mark angle of incidence. Fix two pins P_1 and P_2 on the incident ray. Place the glass slab and looking through the glass slab from the opposite side fix two more pins P_3 and P_4 such that they are in line with the images of the pins P_1 and P_2 . Remove the glass slab and join the points P_3 and P_4 marked to meet the slab. Draw the normal where the emergent ray meets the slab and also the refracted ray.

Measure the angle of incidence, angle of refraction and angle of emergence. Repeat the experiment for two more angles of incidence.

Result:-

1. Angle of incidence=angle of emergence.
2. Angle of refraction is less than angle of incidence.

Precautions:-

1. The pins should be upright.
2. Angle of incidence should be between 30° and 60° .
3. The minimum distance between the pins should be 1 cm or more.