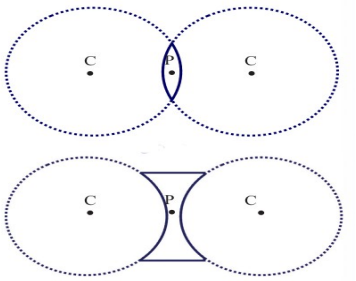
PHYSICS - X-PART-5 CLASS 43

Lens

A lens is a transparent medium having spherical surfaces.

Terms and characteristics associated with convex and concave lenses.



1. Optic centre

Optic centre is the midpoint of a lens (P).

2. Centre of curvature

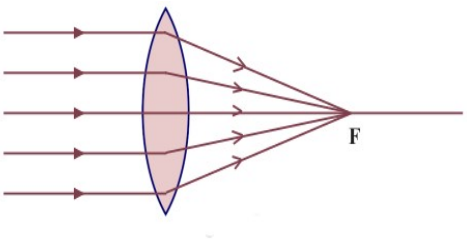
A lens has two spherical surfaces as parts of the lens. Centre of curvature (C) is the centre of the imaginary spheres of which the sides of the lens are parts.

3. Principal axis

Principal axis is the imaginary line that passes through the optic centre joining the two centres of curvature.

4. Principal focus

a) Principal focus of a convex lens



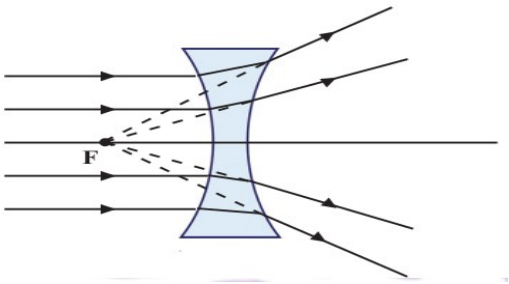
Light rays incident parallel and close to the principal axis after refraction converges to a point on the principal axis of a convex lens. This point is the principal focus of a convex lens

*** The principal focus of a convex lens is real**

*** The convex lens has two focuses.**

b) Principal focus of concave lens

Light rays incident parallel and close to the principal axis diverge from one another after refraction. These rays appear to originate from a point on the same side. This point is the principal focus of a concave lens.



*** The principal focus of a concave lens is virtual.**

*** The concave lens has two focuses.**

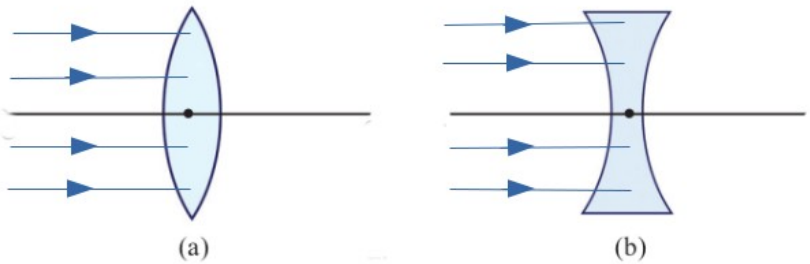
Focal length

Focal length is the distance from the optic centre to the principal focus. This is denoted by the letter f'.

Formation of image using a Convex lens

Position of object	Position of image	Nature of image/ size		
		Real/ virtual	Inverted/ erect	Magnified/ diminished/ same size
1. At infinity	At F	Real	Inverted	Diminished
2. Beyond 2 F	Between 2F and F	Real	Inverted	Diminished
3. At 2 F	At 2F	Real	Inverted	Same size
4. Between 2F and F	Beyond 2 F	Real	Inverted	Magnified
5. At F	At infinity	Real	Inverted	Very much magnified
6. Between F and lens	At behind the lens	Virtual	Erect	Magnified

Worksheet



1. The light rays falling on the convex and concave lens are imaged. Draw the refractive rays and mark the principal focus.