

Physics Class Notes

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Lens

A lens is a transparent medium having spherical surfaces. Convex and concave lenses are the lenses that we mainly use.

Terms associated with lenses

1. Optic centre (P)

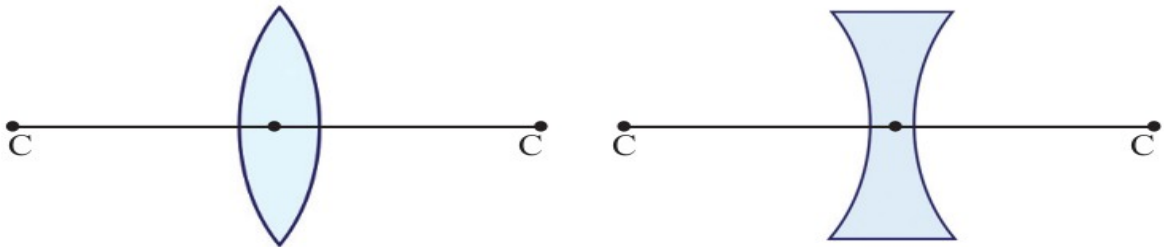
Optic centre is the midpoint of the lens.

2. Centre of curvature (C)

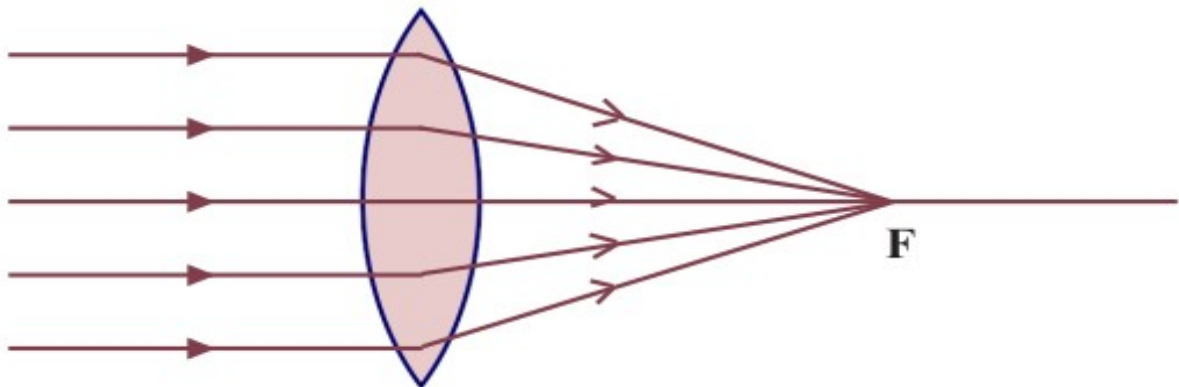
Centre of curvature (C) is the centre of the imaginary spheres of which the sides of the lens are parts.

3. Principal axis

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



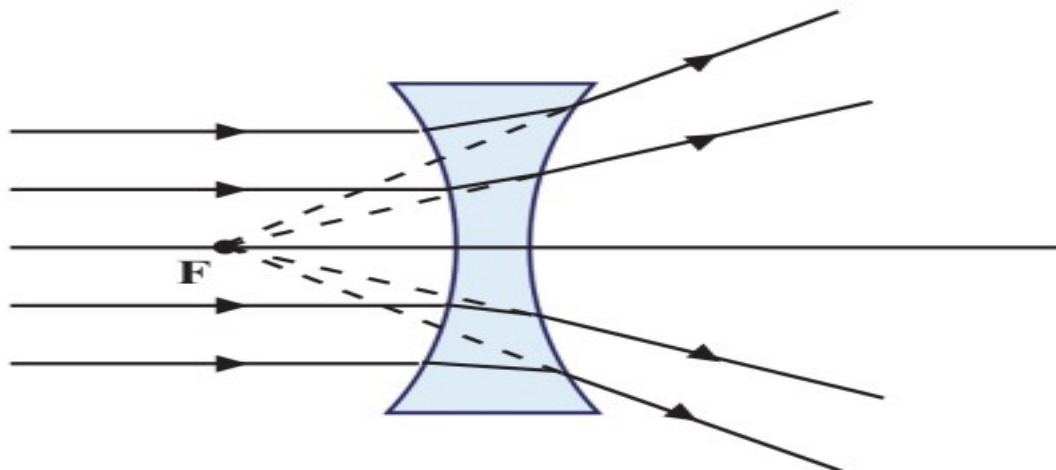
Principal Focus of a convex lens (F)



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 since the light rays converge at a point. This is indicated by the letter F.

Principal Focus of a Concave lens (F)



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.

It is impossible to produce real convergence of light using a concave lens. Therefore the principal focus of a concave lens is virtual.

Focal length (f)

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

Image Formation of Convex Lens

Position of the Object	Position Of the Image	Nature of the Image	Size of the Image
At infinity	At F	Real & Inverted	Diminished
Beyond 2F	Between F and 2F	Real & Inverted	Diminished
At 2F	At 2F	Real & Inverted	Same size as that of the object
Between F and 2F	Beyond 2F	Real & Inverted	Magnified
At F	Infinity (No image)	-	-
Between F and the lens	On the same side	Virtual & Erect	Magnified