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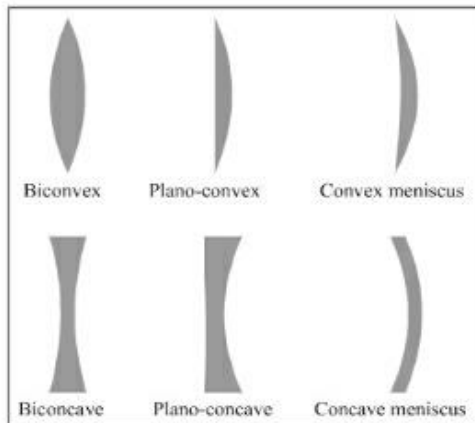
$$\Rightarrow \frac{A'B'}{AB} = \frac{-PA'/\mu_2}{PA/\mu_1}$$

$$\text{Hence, } m = \frac{v/\mu_2}{u/\mu_1}$$

6. THIN LENS

A thin lens is defined as a portion of transparent refracting medium bounded by two surfaces. One of the two surfaces must be curved. Following figures show a number of lenses formed by different refracting surfaces.

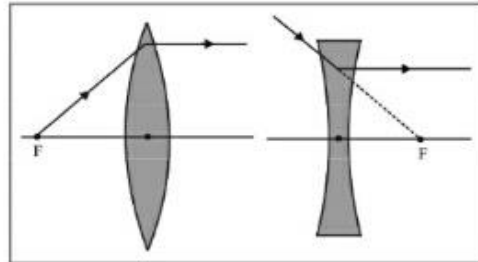
A lens is one of the most familiar optical devices for a human being. A lens is an optical system with two refracting surfaces. The simplest lens has two spherical surfaces close enough together that we can neglect the distance between them (the thickness of the lens). We call this a thin lens.



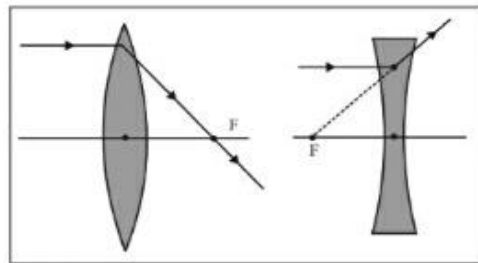
6.1 Terms Related with Lenses

- Centre of curvature (C_1 and C_2):** The two bounding surfaces of a lens are each part of a complete sphere. The centre of the sphere is the centre of curvature.
- Radius of curvature (R_1 and R_2):** The radii of the curved surfaces forming the lens are called radii of curvature.
- Principal axis:** The line joining the two centres of curvature is called principal axis.
- Optical centre:** A point on the principal axis of the lens from which a ray of light passes undeviated.
- Principal foci:** There are two principal foci of a lens.
- First principal focus F_1 :** It is a point on the principal axis, such that a ray, diverging from the point or converging

towards the point, after refraction becomes parallel to principal axis.



- Second principal focus F_2 :** It is a point on principal axis, such that a ray moving parallel to principal axis, after refraction converges or diverges towards the point.



- Focal Length:** The distance between optical centre and second principal focus is focal length. Assumptions and sign conventions are same as these of mirrors with optical centre C in place of pole P of the mirror.

6.2 Ray diagram

To construct the image of a small object perpendicular to the axis of a lens, two of the following three rays are drawn from the top of the object.

- A ray parallel to the principal axis after refraction passes through the principal focus or appears to diverge from it.

