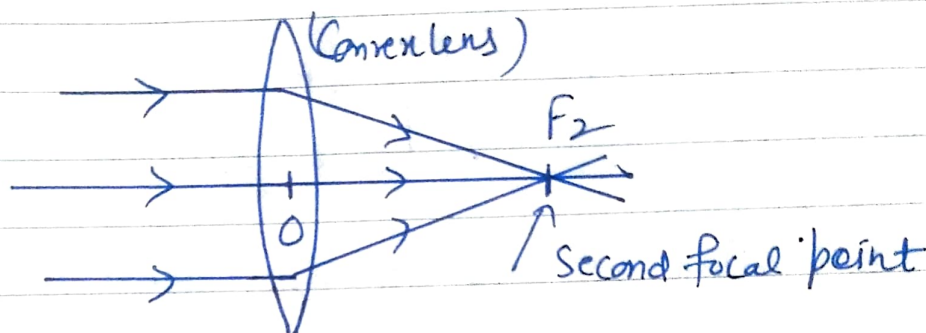
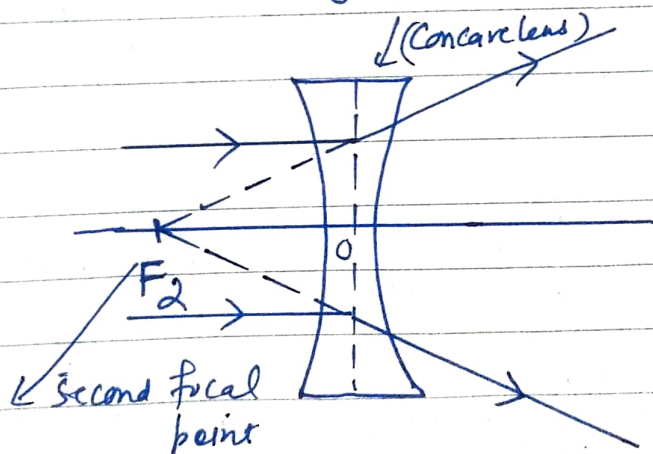


* Second focal point : →

↓
For Convex lens : → It is the point on the principal axis of the lens such that rays of light incident parallel to principal axis, after refraction from the lens pass through it.



For Concave lens : → It is the point on the principal axis of the lens such that rays of light incident parallel to principal axis, after refraction through the lens appear to be diverging from this point.

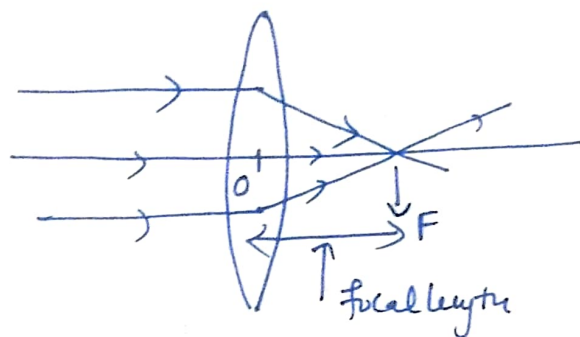


* Focal Plane : → A plane passing through the principal focus and is normal to the principal axis is called as focal plane. A lens has two focal planes corresponding to two foci of the lens.

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* focal length $\Rightarrow$ The distance of focus from the Optical Centre of the lens is called its focal length.

A lens has two focal lengths corresponding to the two foci.



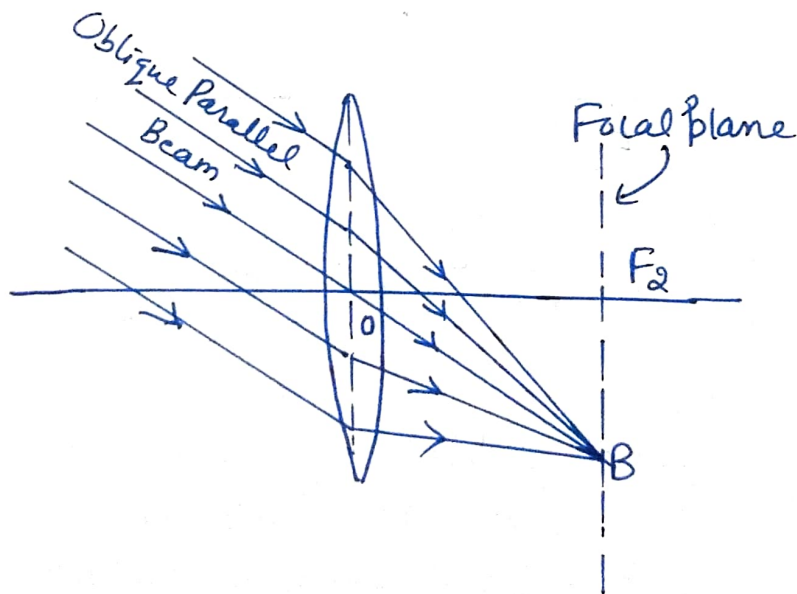
$$[OF = f (\text{focal length})]$$

(Note) $\Rightarrow$ When we say focus, we generally say about second focal point and second focal length.

* A Convex lens has ^a real focus.

* A Concave lens has ^a virtual focus.

$\Rightarrow$ When beam of light is incident obliquely then light rays converge at some point B in the second focal plane of the lens.



$\Rightarrow$ If medium on both sides of a lens is same (Suppose a lens is placed in air (outside of lens is air)) then focal lengths are same i.e. $f_1 = f_2$

Note

* If a part of a lens is covered then amount of light entering the lens decreases due to which

intensity of the image formed by the lens decreases but its focal length remains same. So, position and nature, size of the image do not change.

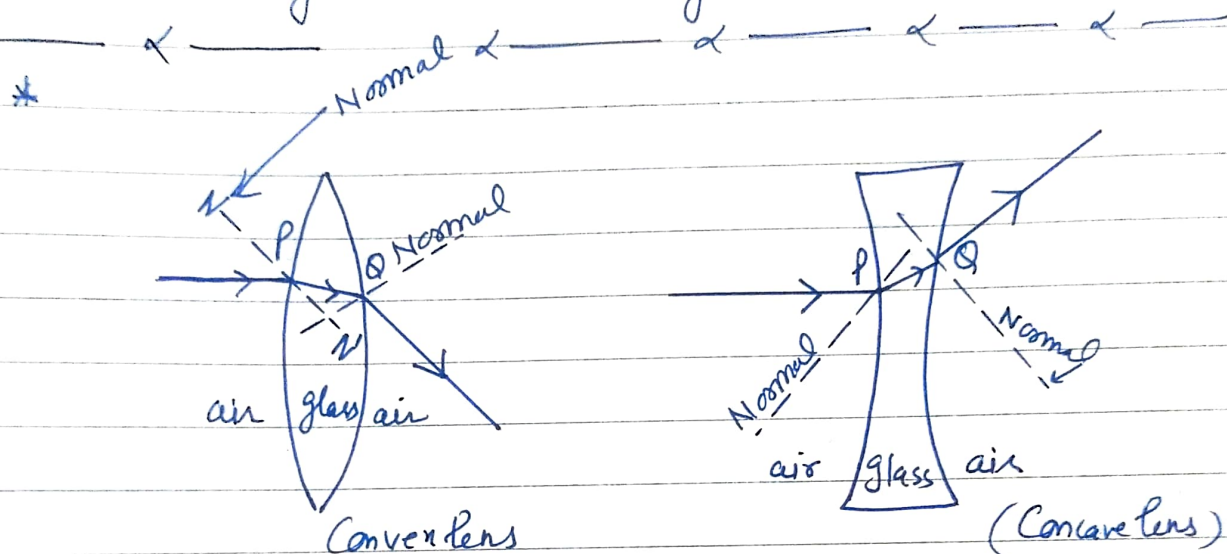


Fig shows refraction at two surfaces of the lens i.e from P and Q.

Q On what factors does the focal length of a lens depend?

Ans (i) Refractive index of material of a lens $\therefore$

If a lens is placed in water instead of air (i.e if μ decreases), its focal length will increase. ($\because f \propto \frac{1}{\mu}$)

(ii) The radii of Curvature of two surfaces of lens $\therefore$

A thick lens has less focal length than a thin lens of the same material

[$\because$ Radius of Curvature of a thick lens is less

than the radius of Curvature of a thin

[$f \propto R$]

Teacher's Signature (lens)