

Chp 7 - Lenses.

Lens
↓

A transparent surface with at least one curved surface.

1]



Glass slab.

Since glass slab does not have a curved surface

∴ It is not a lens.

2]

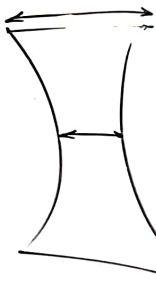


Since this object has atleast one curved surface. Thus it is a lens.

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Types of Lenses.

①



(Biconcave) Concave Lens.

This lens is thinner at the centre and thicker at the edges.

②

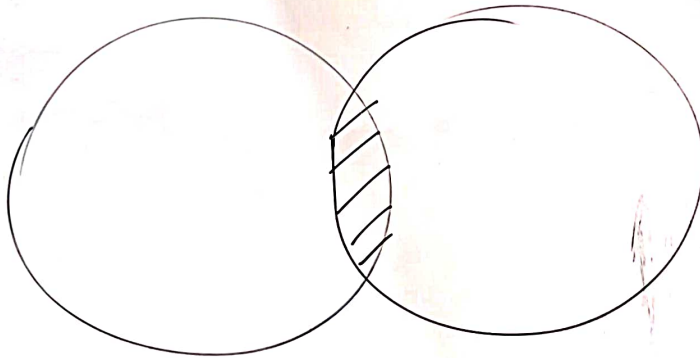


(Biconvex) Convex Lens

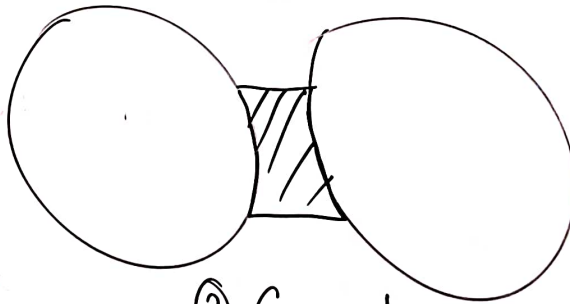
This lens is thicker at the centre and thinner at the edges.

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Construction of lenses.



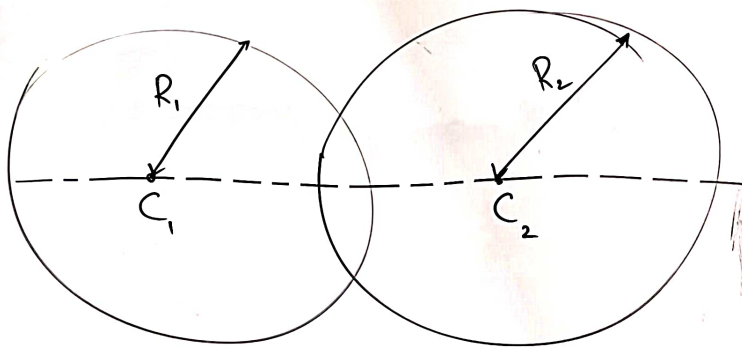
① Convex Lens



② Concave lens.

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Terms Related to Lenses.



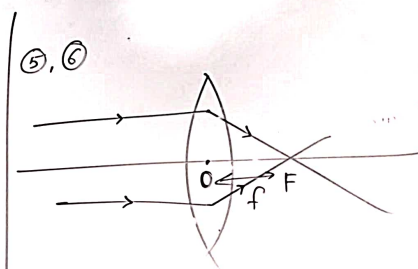
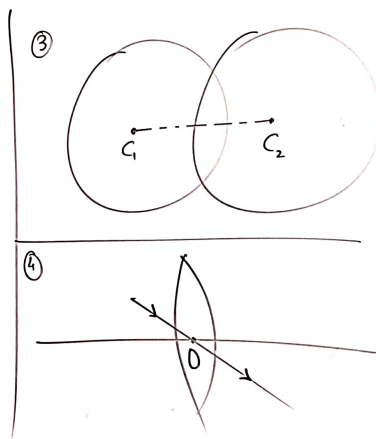
C_1, C_2 = Centre of curvature
 R_1, R_2 = Radius of Curvature.

10/09/24
Tuesday

Subject:- Science -1

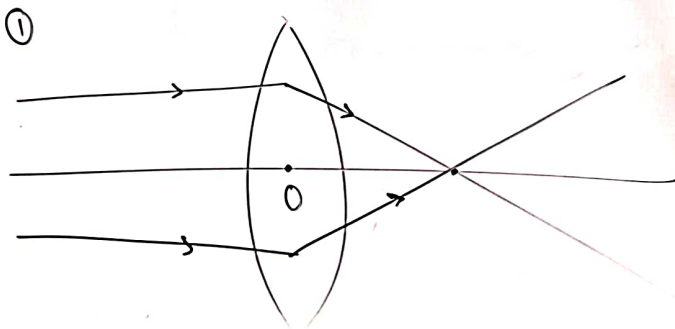
Terms related to lens.

- ① Centre of curvature (C)
- ② Radius of curvature (R)
- ③ Principal Axis.
- ④ Optical Centre
- ⑤ Principal Focus (F)
- ⑥ Focal length (f)



Chp 7 - Lenses.

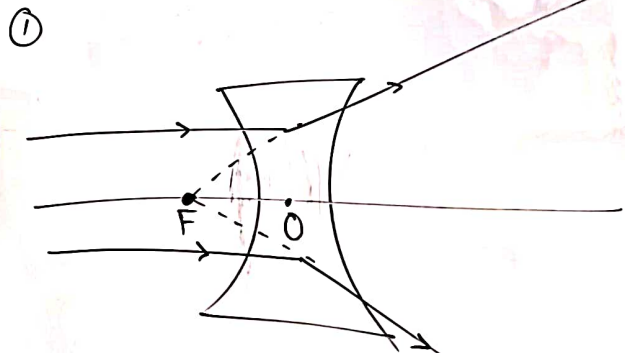
Convex Lens



Refracted ray converge at a single point.

Thus convex lens is also known as converging lens.

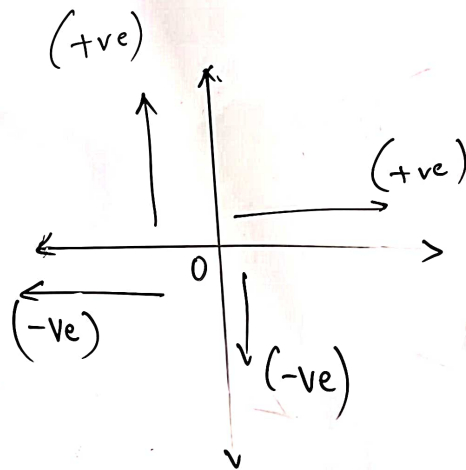
Concave Lens



Refracted ray diverge away from each other

Thus concave lens is also known as diverging lens.

Sign conventions



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Lens Formula.

u = Object distance

v = Image distance

f = Focal length

h_1 = Height of object

h_2 = Height of image

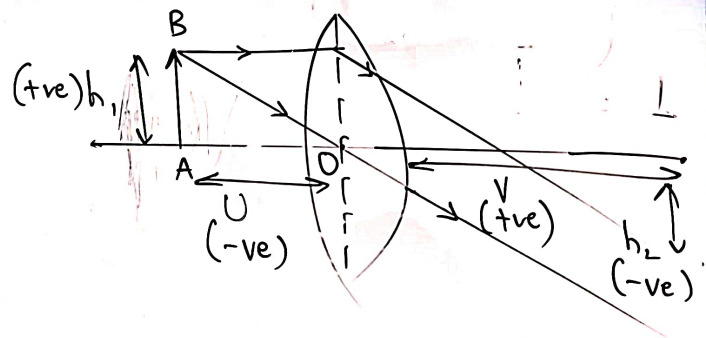
$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

Magnification (M)

① $M = \frac{h_2}{h_1}$

② $M = \frac{v}{u}$

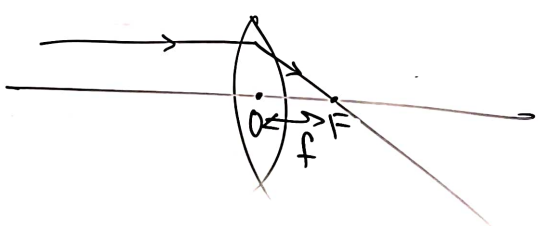
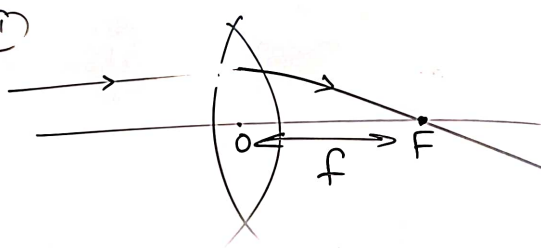
③ $\frac{h_2}{h_1} = \frac{v}{u}$



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Power of Lens.

①



$P \propto \frac{1}{f}$
 $f \uparrow \quad P \downarrow$
 $f \downarrow \quad P \uparrow$

$$P = \frac{1}{f}$$

SI unit of power:

$$P = \frac{1}{f}$$

↓
Diopetre (D)

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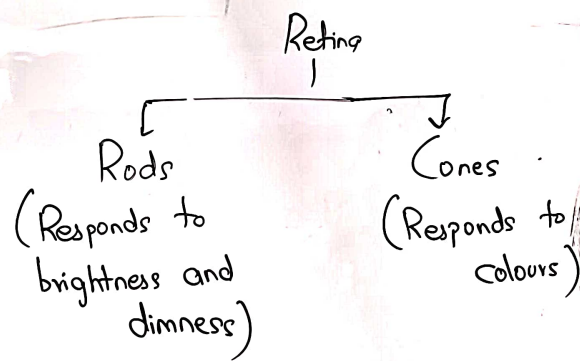
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Combination of lenses

$$P = P_1 + P_2$$

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$$

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Sclera.

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Defects of Vision

