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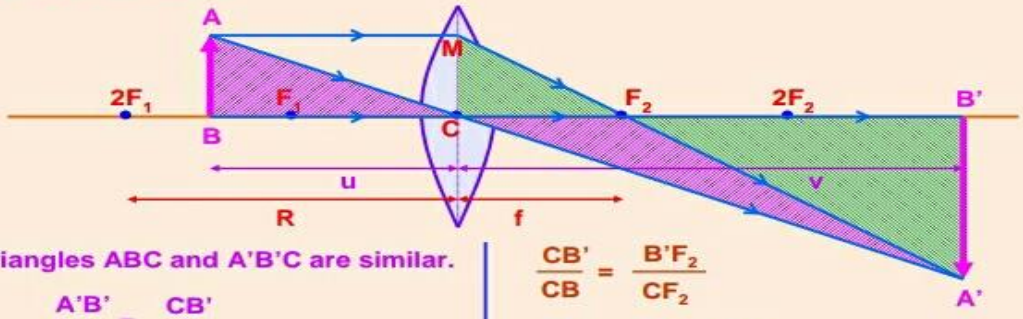
Continued… …

Thin Lens Formula (Gaussian Form of Lens Equation):

For Convex Lens:



Triangles ABC and A'B'C are similar.

$$\frac{A'B'}{AB} = \frac{CB'}{CB}$$

Triangles MCF_2 and $A'B'F_2$ are similar.

$$\frac{A'B'}{MC} = \frac{B'F_2}{CF_2}$$

or $$\frac{A'B'}{AB} = \frac{B'F_2}{CF_2}$$

$$\frac{CB'}{CB} = \frac{B'F_2}{CF_2}$$

$$\frac{CB'}{CB} = \frac{CB' - CF_2}{CF_2}$$

According to new Cartesian sign conventions,

$CB = -u$, $CB' = +v$ and $CF_2 = +f$.

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

Linear Magnification:

Linear magnification produced by a lens is defined as the ratio of the size of the image to the size of the object.

$$m = \frac{I}{O}$$

$$\frac{A'B'}{AB} = \frac{CB'}{CB}$$

According to new Cartesian sign conventions,

$A'B' = +I$, $AB = -O$, $CB' = +v$ and $CB = -u$.

$$\frac{+I}{-O} = \frac{+v}{-u} \quad \text{or} \quad m = \frac{I}{O} = \frac{v}{u}$$

Magnification in terms of v and f:

$$m = \frac{f - v}{f}$$

Magnification in terms of v and f:

$$m = \frac{f}{f - u}$$

Power of a Lens:

Power of a lens is its ability to bend a ray of light falling on it and is reciprocal of its focal length. When f is in metre, power is measured in Dioptre (D).

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