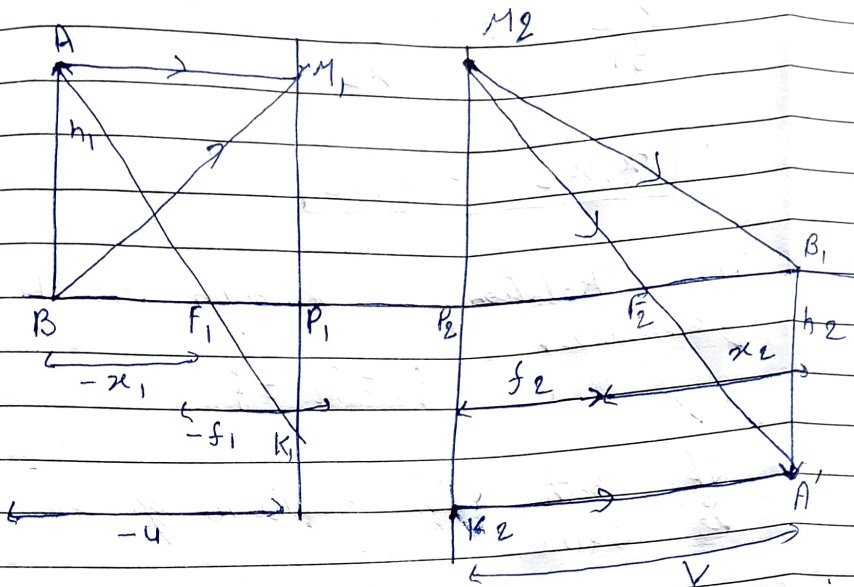


B.Sc - Part - II

Newton's formula for a coaxial lens system using cardinal points:



From $\triangle ABF_1$ and $\triangle P_1F_1K_1$ both are similar

$$AB \Rightarrow +h_1$$

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$$\frac{AB}{P_1K_1} = \frac{BF_1}{F_1P_1}$$

$$P_1K_1 = A'B' = -h_2$$

$$BF_1 = -x_1$$

$$F_1P_1 = -f_1$$

$$\frac{h_1}{-h_2} = \frac{-x_1}{-f_1}$$

$$\frac{h_1}{h_2} = \frac{-x_1}{f_1} \quad \text{--- (i)}$$

From \triangle 's $H_2P_2F_2$ and $A'B'F_2$

$$\frac{A'B'}{H_2P_2} = \frac{F_2B'}{P_2F_2}$$

$$-\frac{h_2}{h_1} = \frac{x_2}{f_2}$$

$$\frac{h_2}{h_1} = \frac{-x_2}{f_2}$$

$$h_1 = -\frac{f_2}{x_2} \quad \text{--- (ii)}$$



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From eqⁿ (i) and (ii)

$$\frac{+x_1}{f_1} = +\frac{f_2}{x_2}$$

$$x_1 x_2 = f_1 f_2$$

This Relation is known as Newton's formula.

$$f_1 = f_2 = f$$

If both side medium of lens system is same

$$x_1 x_2 = f^2$$