Positive eyepiece →

In this eyepiece magnification of real image of objective lens is done so this eyepiece is positive eyepiece.

Position of cross wire →

In cross wire is placed at the I_o position then its magnification is done by both field lens and eye lens. and their final images obtain at the same plane.

Cardinal points for Ramsden's eyepiece

First principle point

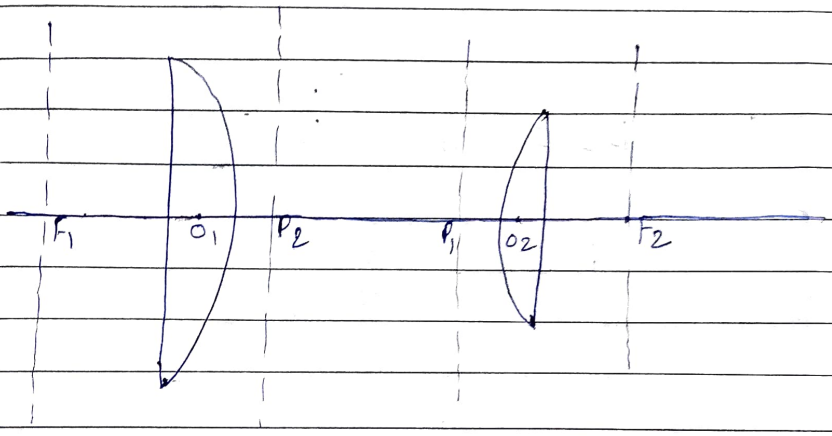
$$\alpha_1 = \frac{df}{F_2} \qquad d = \frac{2f}{3}$$

$$F = \frac{3}{4} f$$

$$F_2 = f$$

$$\alpha_1 = \frac{2f}{3} \times \frac{3f}{4_2} \times \frac{1}{f}$$

$$\boxed{\alpha_1 = \frac{f}{2}}$$



second principal point

$$\alpha_2 = -\frac{df}{F_1} = -\frac{2f}{3} \times \frac{3f}{4_2} \times \frac{1}{f}$$

$$\boxed{\alpha_2 = \frac{-f}{2}}$$

First focus point (B_1)

$$B_1 = -F\left(1 - \frac{d}{F_2}\right)$$

$$B_1 = -\frac{3}{4}f\left(1 - \frac{2f}{3} \times \frac{1}{f}\right)$$

$$B_1 = -\frac{3}{4}f\left(\frac{1}{3}\right)$$

$$\boxed{B_1 = -\frac{f}{4}}$$

Second focus point (B_2)

$$B_2 = F\left(1 - \frac{d}{f_1}\right)$$

$$B_2 = \frac{3}{4}f\left(1 - \frac{2f}{3} \times \frac{1}{f}\right)$$

$$B_2 = \frac{3}{4}f\left(\frac{1}{3}\right)$$

$$\boxed{B_2 = \frac{f}{4}}$$

— x —