G20MICIN

Microscope. Configuration for Magnifier : Virtual image at Infinity
In most microscopes focal length of first lens is chosen such that xi1 =16 +f1
as a fixed distance

1.Lens: Objective lens. Calculation to get xo1

$f1 := 2 \qquad xi1 := 16 + f1$

$$xo1 := \frac{-1}{\left(\frac{1}{f1}\right) - \frac{1}{xi1}} \qquad xo1 = -2.25$$

2.Magnifier Lens (ocular). In the "Virtual image at infinity Configuration" the image should be virtual and is at negative infinity.

$xi2 := -10^{10} \qquad f2 := 6$

$$xo2 := \frac{-1}{\left(\frac{1}{f2}\right) - \frac{1}{xi2}} \qquad xo2 = -6$$

We can calculate the distance a between the objective lens (L1) and ocular lens (L2) as

$a := 16 + f1 - xo2 \qquad a = 24$

3. Magnification (The eye is not involved)

$$M1 := \frac{xi1}{xo1} \cdot \frac{xi2}{xo2} \qquad M1 = -1.333 \times 10^{10}$$

We get a meaningless value, therefore calculate the "angular magnification"

$$MP := \left(1 - \frac{xi1}{f1}\right) \cdot \left(\frac{25}{f2}\right) \qquad MP = -33.333$$

Neglecting f1 with respect to 16 we have

$xxi1 := 16$

$$MMP := \left(1 - \frac{xxi1}{f1}\right) \cdot \left(\frac{25}{f2}\right) \qquad MMP = -29.167$$

Neglecting 1 in the first bracket

$$MMMP := \left(\frac{-xxi1}{f1}\right) \cdot \left(\frac{25}{f2}\right) \qquad MMMP = -33.333$$