

G16MAG2L

Magnifier as two thin lens system.

Distance between lenses: $D = 1$ cm.

The image of the first lens should be virtual and more to the left of the second lens than 25 cm.

1.First lens: Magnifier.

$$x_{1o} := -5 \quad f_1 := 6$$

$$x_{1i} := \frac{1}{\left(\frac{1}{f_1}\right) + \frac{1}{x_{1o}}} \quad x_{1i} = -30$$

The virtual image of lens 1 is real object for lens 2 and since $D = 1$, the object distance for lens 2 is -31

2.Lens 2: Eye lens $f_2 := 1.85$

$$D := 1 \quad x_{2o} := -D + x_{1i} \quad x_{2o} = -31$$

$$x_{2i} := \frac{1}{\left(\frac{1}{f_2}\right) + \frac{1}{x_{2o}}} \quad x_{2i} = 1.967$$

3. Magnification for each lens and product for the magnification of the system.

$$\text{magnifier} \quad m_1 := \frac{x_{1i}}{x_{1o}} \quad m_1 = 6$$

$$\text{eye} \quad m_2 := \frac{x_{2i}}{x_{2o}} \quad m_2 = -0.063$$

$$\text{System} \quad m_1 \cdot m_2 = -0.381$$