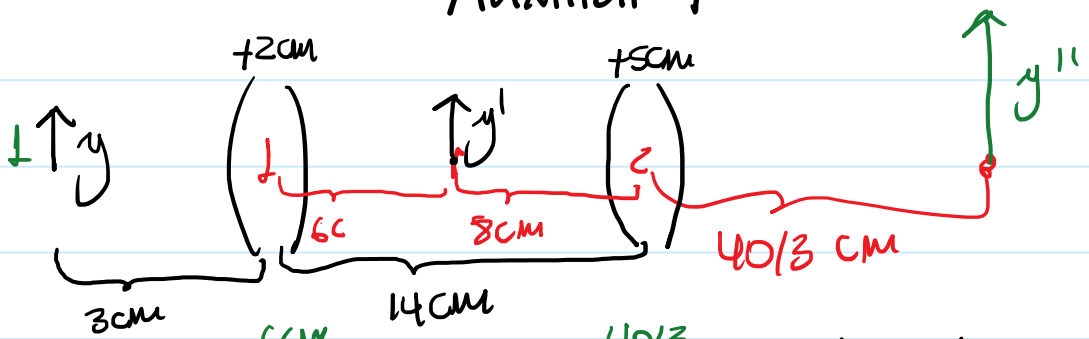
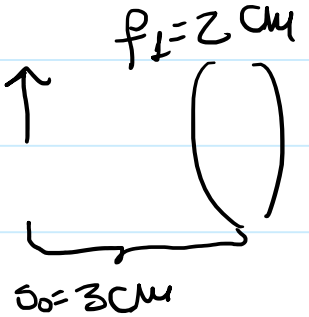
Auxiliar 7



$M_1 = \frac{6cm}{3cm}$ $M_2 = \frac{40/3}{8\,cm}$ $\frac{1}{s_o} + \frac{1}{s_i} = \frac{1}{f}$

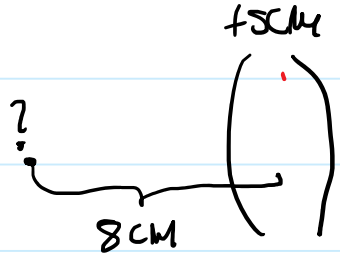
Parte 1



$\frac{1}{3} + \frac{1}{s_i} = \frac{1}{2} \rightarrow \frac{1}{s_i} = \frac{1}{2} - \frac{1}{3}$

$\frac{1}{s_i} = \frac{3-2}{6} = \frac{1}{6} \rightarrow \boxed{s_i = 6\,cm}$

Parte 2



$s_o' = 8\,cm$
$s_i' = ?$
$f_2 = 5\,cm$

$\frac{1}{8} + \frac{1}{s_i'} = \frac{1}{5}$

$\frac{1}{s_i'} = \frac{1}{5} - \frac{1}{8} = \frac{8-5}{40}$

$\frac{1}{s_i'} = \frac{3}{40} \rightarrow \boxed{s_i' = \frac{40}{3}}$

La posición es 40/3 cm a la derecha del lente 2

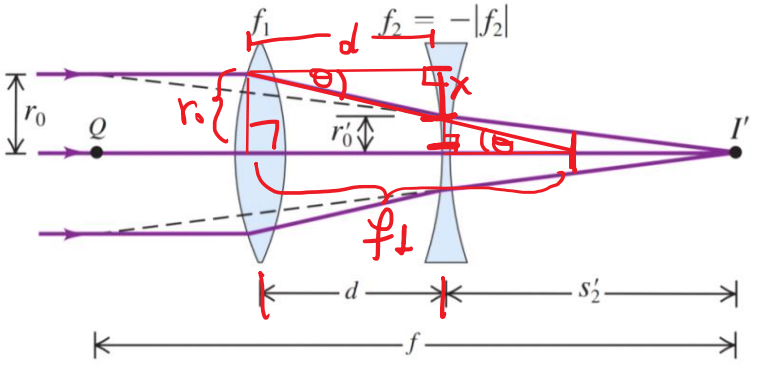
$M = \frac{y''}{y'} \cdot \frac{y'}{y} = \frac{s''}{s'} \cdot \frac{s'}{s} = M_2 M_1$

$= \frac{40/3}{8} \cdot \frac{6}{3} = \frac{4 \cdot 5 \cdot 2}{8 \cdot 3}$

$= \frac{10}{3} > 1$

Auxiliar 7

$$\frac{1}{s_o}+\frac{1}{s_i}=\frac{1}{f}$$



r_0

¿r_0'?

$$r_0 = r_0' + x$$

$$tg\theta = \frac{x}{d}$$

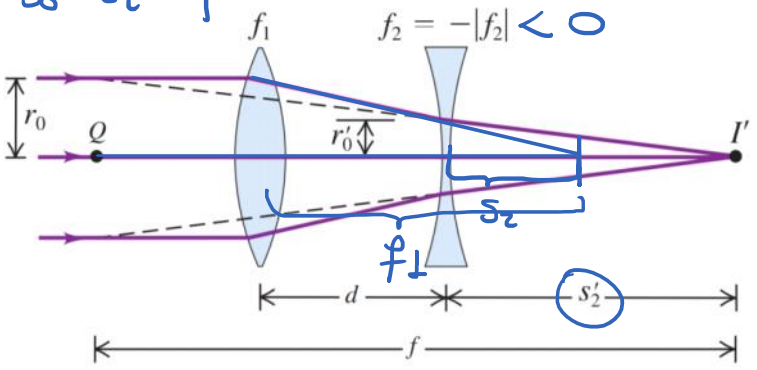
$$tg\theta = \frac{r_0}{f_1}$$

$$tg\theta = tg\theta \rightarrow \frac{x}{d} = \frac{r_0}{f_1} \rightarrow x = r_0 \cdot \frac{d}{f_1}$$

$$r_0 = r_0' + r_0\frac{d}{f_1} \rightarrow r_0' = r_0\left(1-\frac{d}{f_1}\right) = r_0\left(\frac{f_1-d}{f_1}\right)$$

$$r_0' = r_0\left(\frac{f_1-d}{f_1}\right)$$

$$\frac{1}{s_o}+\frac{1}{s_i}=\frac{1}{f}$$



$$s_2 = f_1 - d$$

$$\frac{1}{f_1-d}+\frac{1}{s_2'}=\frac{1}{f_2}$$

$$\frac{1}{s_2'} = \frac{1}{f_2} - \frac{1}{f_1-d} = \frac{f_1-d-f_2}{f_2(f_1-d)}$$

$$|x| = \begin{cases} x \text{ si } x>0 \\ -x \text{ si } x<0 \end{cases}$$

$$s_2' = \frac{f_2(f_1-d)}{f_1-d-f_2}$$

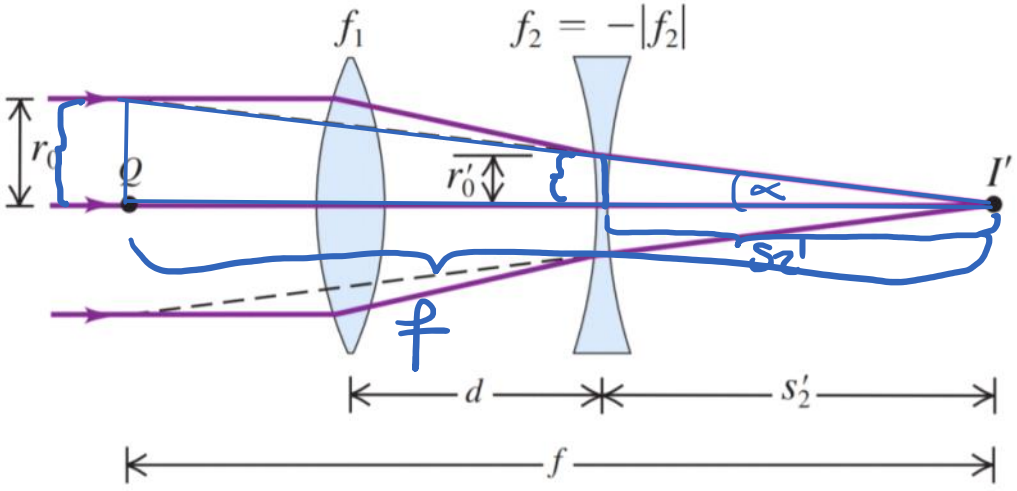
$$f_2 < f_1 - d$$

$$|f_2| = -f_2$$

$$f_2 = -|f_2|$$

$$s_2' = -\frac{|f_2|(f_1-d)}{f_1-d+|f_2|}$$

Auxiliar 7



$$tg\alpha = \frac{r_0}{f}$$

$$tg\alpha = \frac{r_0'}{s_2'}$$

$$tg\alpha = tg\alpha \Rightarrow \frac{r_0}{f} = \frac{r_0'}{s_2'} \Rightarrow f = \frac{r_0}{r_0'} \cdot s_2'$$

$$f = \frac{-r_0}{r_0\left(1 - \frac{d}{f_2}\right)} \cdot \frac{|f_2|(f_1 - d)}{f_2 - d + |f_2|}$$

$$\boxed{f = -\frac{|f_2|(f_1 - d) f_1}{(f_2 - d)(f_1 - d + |f_2|)}}$$