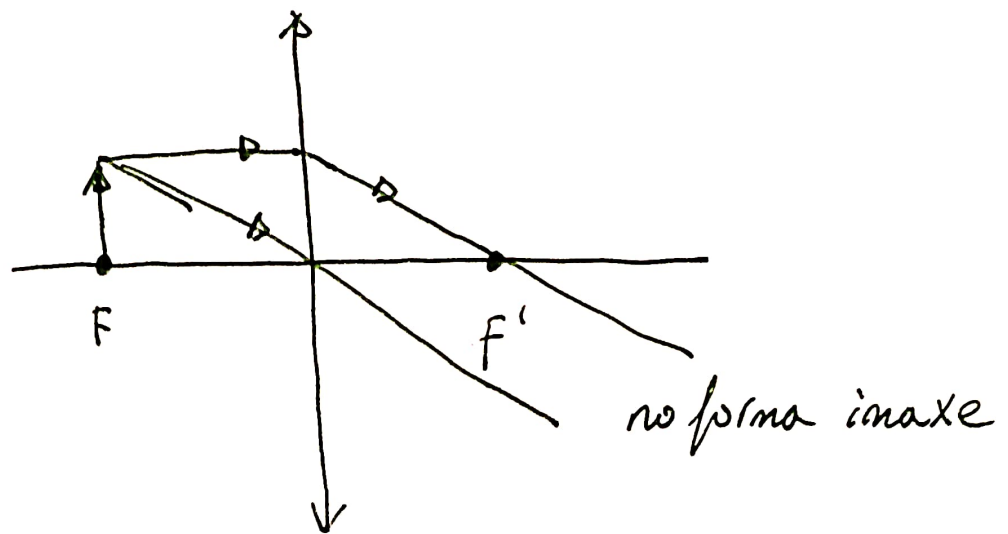
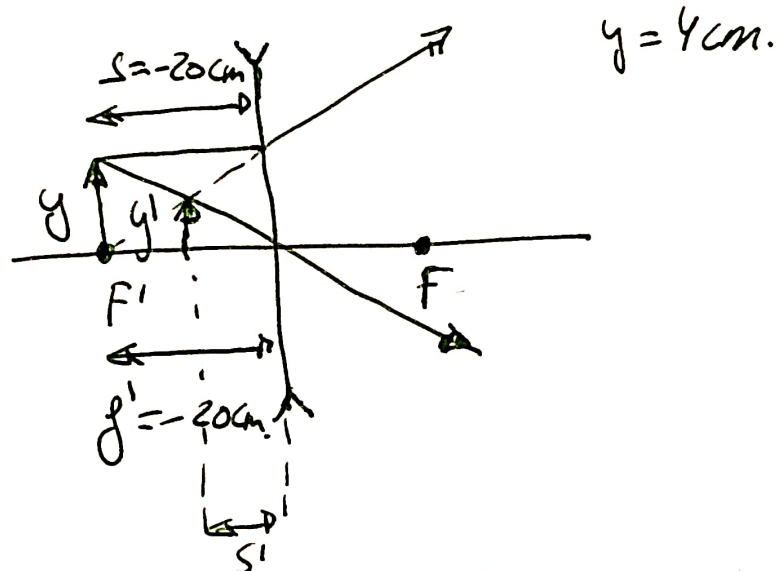


1.-



e' divergente.



$$\frac{1}{s'} - \frac{1}{s} = \frac{1}{f'} \Rightarrow \frac{1}{s'} = \frac{1}{s} + \frac{1}{f'} \Rightarrow s' = \frac{1}{\frac{1}{s} + \frac{1}{f'}}$$

$$s' = \frac{s \cdot f'}{s + f'} \Rightarrow s' = \frac{(-20\text{cm})(-20\text{cm})}{(-20\text{cm}) + (-20\text{cm})} = \frac{400\text{cm}^2}{-40\text{cm}} = -10\text{cm}.$$

$$\frac{y'}{y} = \frac{s'}{s} \Rightarrow y' = y \frac{s'}{s} = 4\text{cm} \frac{(-10\text{cm})}{(-20\text{cm})} = 2\text{cm}.$$

$$P = \frac{1}{f} = \frac{1}{-0.2\text{m}} = -5 \text{ Dioptrías}$$

2.-

$$\frac{y'}{y} = -\frac{s'}{s} \quad ; \quad \frac{1}{s'} + \frac{1}{s} = \frac{1}{f}$$

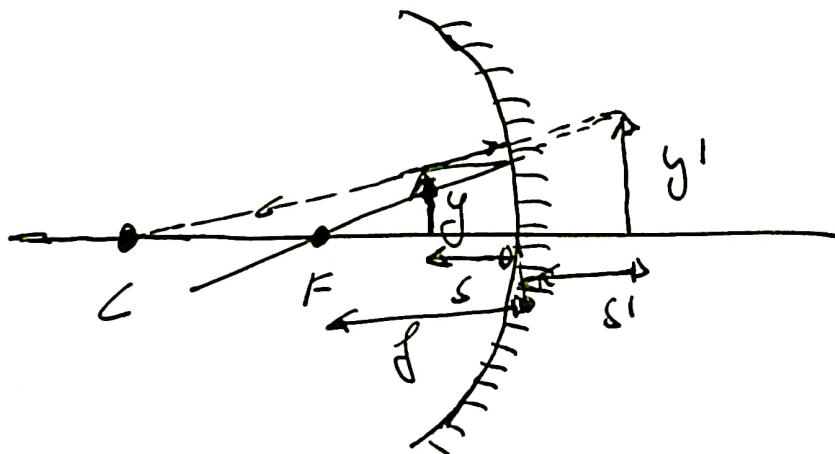
$$\frac{y'}{y} = 1.5 \quad ; \quad s = 20 \text{ cm.}$$

$$\frac{y'}{y} = -\frac{s'}{s} \Rightarrow 1.5 = -\frac{s'}{s} \Rightarrow s' = -1.5s$$

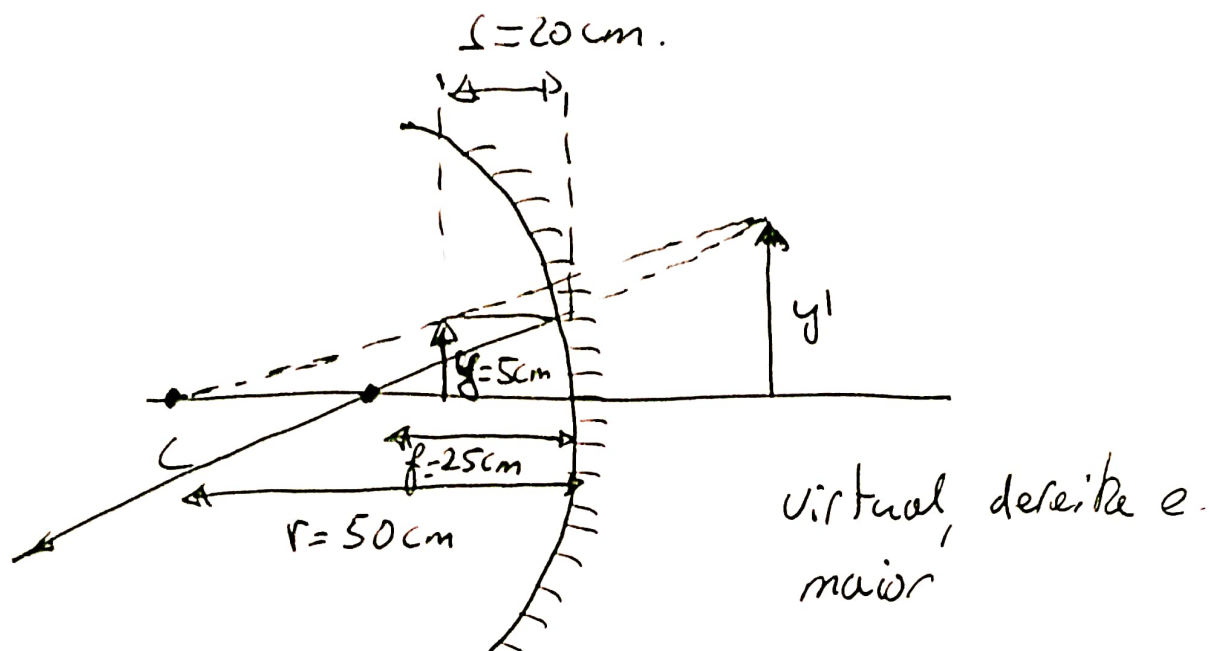
$$\frac{1}{s'} + \frac{1}{s} = \frac{1}{f} \Rightarrow f = \frac{1}{\frac{1}{s'} + \frac{1}{s}} = \frac{1}{\frac{1}{-1.5s} + \frac{1}{s}}$$

$$f = \frac{s \cdot s'}{s + s'} \quad ; \quad f = \frac{(-1.5s) \cdot s}{s - 1.5s} = \frac{-1.5s \cdot s}{-0.5s} = -3s$$

$$s = -60 \text{ cm.}$$



3.-



$$\frac{1}{s'} + \frac{1}{s} = \frac{1}{f} \Rightarrow \frac{1}{s'} = \frac{1}{f} - \frac{1}{s}$$

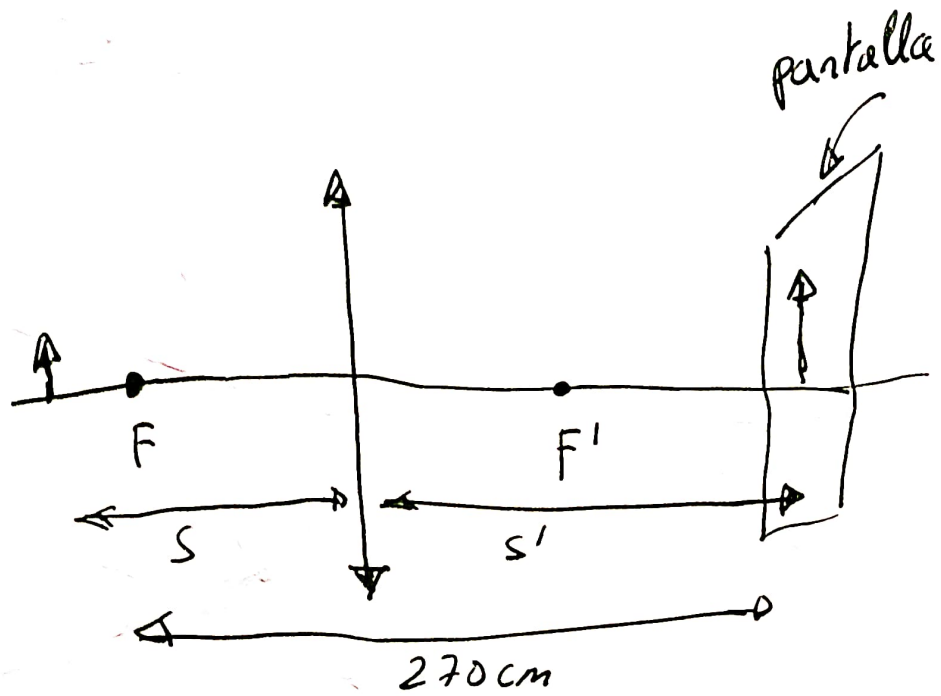
$$\frac{1}{s'} = \frac{s-f}{s \cdot f} \Rightarrow s' = \frac{s \cdot f}{s-f} = \frac{(-20\text{ cm}) \cdot (-25\text{ cm})}{-20\text{ cm} + 25\text{ cm}} =$$

$$= \frac{500\text{ cm}^2}{5\text{ cm}} = 100\text{ cm}$$

$\uparrow$
 $-20\text{ cm} - (-25\text{ cm})$

$$\frac{y'}{y} = -\frac{s'}{s} \Rightarrow y' = -y \frac{s'}{s} = -5\text{ cm} \frac{100\text{ cm}}{-20\text{ cm}} = 25\text{ cm}$$

4.-



$$s + s' = 270 \text{ cm.}$$

$$\frac{y'}{y} = 10 \Rightarrow y' = 10y \quad ; \quad \frac{y'}{y} = \frac{s'}{s}$$

$$s' = 10s$$

$$s + 10s = 270 \text{ cm} \Rightarrow s = \frac{270 \text{ cm}}{11} = 24'55 \text{ cm}$$

$$s' = 245'5 \text{ cm}$$

$$\frac{1}{s'} - \frac{1}{s} = \frac{1}{f'} \Rightarrow f' = \frac{s \cdot s'}{s - s'}$$

$$f' = \frac{(-245'5 \text{ cm})(24'55 \text{ cm})}{(-24'55 \text{ cm}) - 245'5 \text{ cm}} = +22'3 \Delta$$

$$P = \frac{1}{0'2235 \text{ m}} = 4'48 \text{ dioptrías}$$

