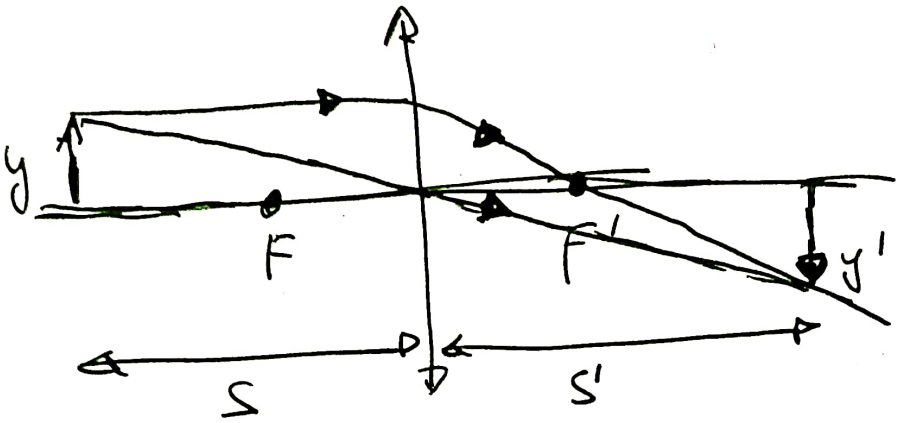
5.- $y = 3\,cm.$

$s = 20cm$

$f' = 10cm.$

a)



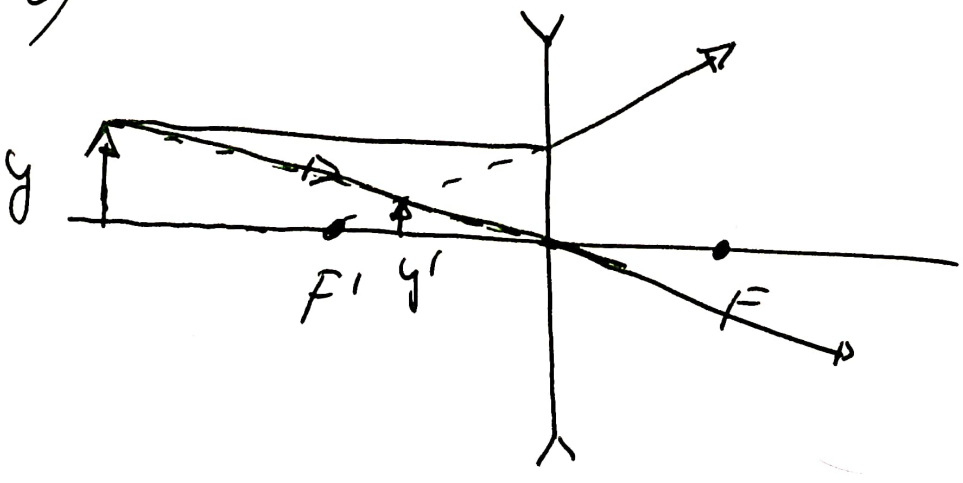
$$\frac{1}{s'} - \frac{1}{s} = \frac{1}{f'} \Rightarrow \frac{1}{s'} = \frac{1}{f'} + \frac{1}{s} \;;\; \frac{1}{s'} = \frac{s+f'}{f' \cdot s}$$

$$s' = \frac{f' \cdot s}{s+f'} \Rightarrow s' = \frac{10cm(-20cm)}{10cm - 20cm} = \frac{-200\,cm^2}{-10cm} = 20cm$$

$$\frac{y'}{y} = \frac{s'}{s} \Rightarrow y' = y\left(\frac{s'}{s}\right)$$

$$y' = 3cm\left(\frac{-20cm}{20cm}\right) = -3cm.$$

b)



5. (CONTINUACIÓN)

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

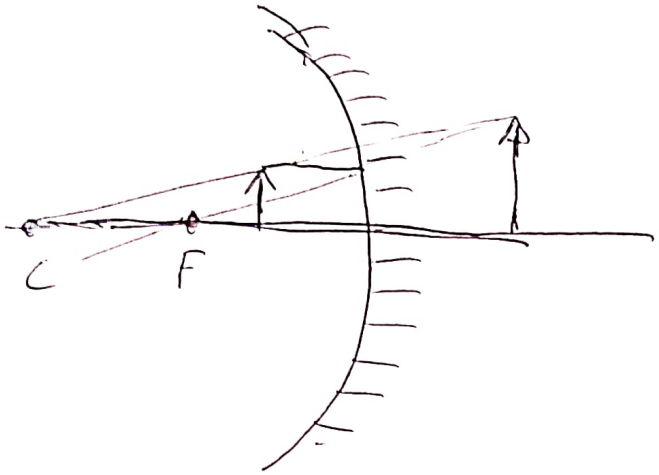
$$\frac{1}{s'} = \frac{s + f'}{s \cdot f'} \Rightarrow s' = \frac{(-20\,cm)(-10\,cm)}{-20\,cm + (-10\,cm)} =$$

$$= \frac{200\,cm^2}{-30\,cm} = -6'67\,cm.$$

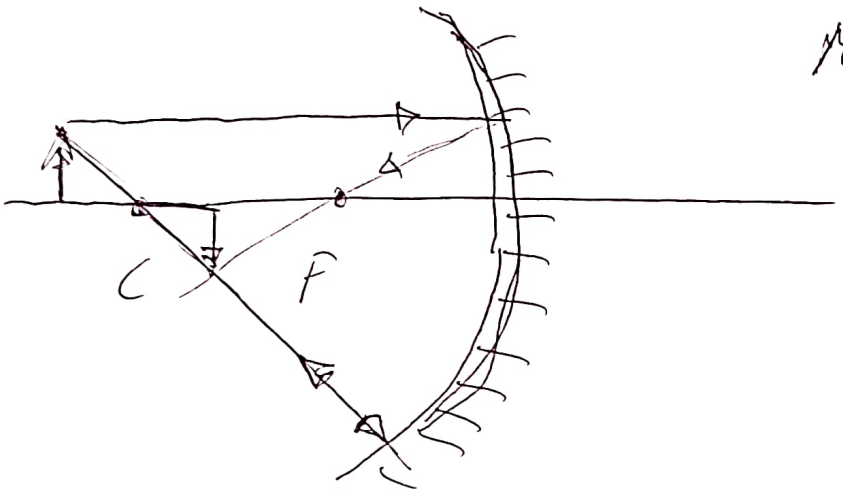
$$\frac{y'}{y} = \frac{s'}{s} \Rightarrow y' = y\,\frac{s'}{s}$$

$$y' = 3\,cm\ \frac{(-6'67\,cm)}{(-20\,cm)} = 1\,cm.$$

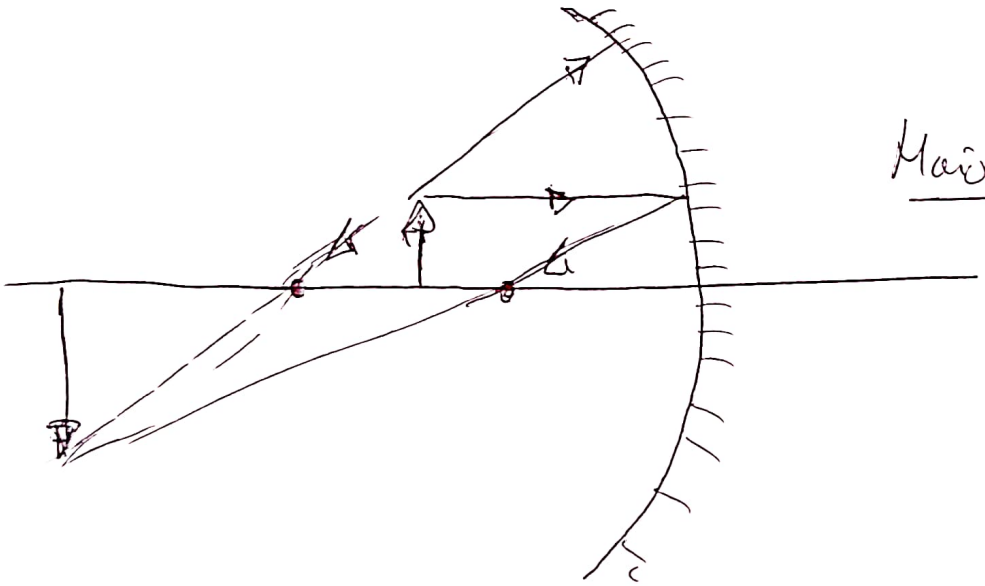
6.-



Non real.



Menor.



Maior e real.

$y = 3'5\,cm.$

$r = R = 15\,cm \quad ; \quad r = -15\,cm \Rightarrow f = -7'5\,cm.$

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

$$s' = 2s$$

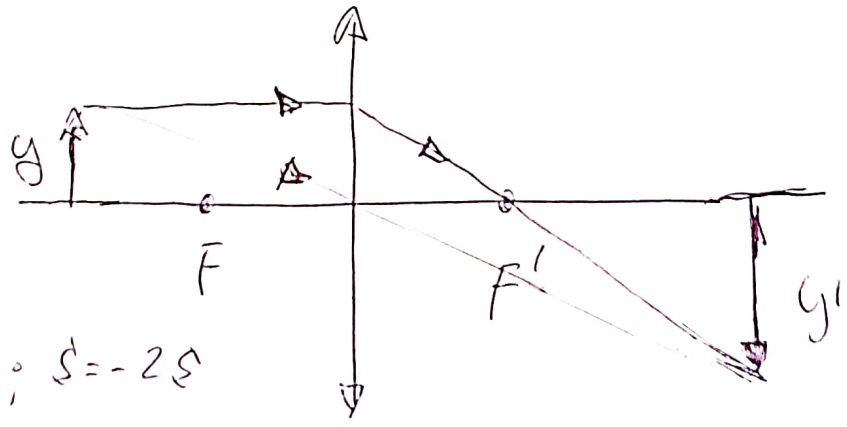
$$\frac{s+s'}{s'\cdot s} = \frac{1}{f} \Rightarrow f = \frac{s'\cdot s}{s+s'} \Rightarrow f = \frac{2s\cdot s}{s+2s} = \frac{2s^2}{3s}$$

$$f = \frac{2}{3}s \Rightarrow s = \frac{3}{2}\cdot f$$

$$s = 1'5(-7'5\,cm) = -11'25\,cm.$$

$$y' = -y\frac{s'}{s} = -1'5\,cm\ \frac{2\times(-11'25cm)}{-11'25cm} = -3\,cm.$$

b) a distancia focal da lente convexente vai ser do mesmo valor que a do espello pero positiva

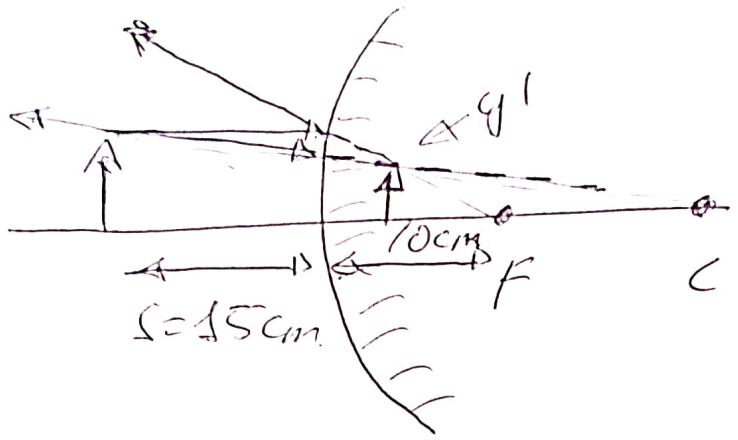


$$\frac{1}{s'} - \frac{1}{s} = \frac{1}{f'} \quad ; \quad s' = -2s$$

$$\frac{1}{-2s} - \frac{1}{s} = \frac{1}{f'} \Rightarrow -\frac{3}{2s} = \frac{1}{f'} \Rightarrow s = -\frac{3}{2}f'$$

$$s = -1'5\cdot f' \Rightarrow s = -11'25\,cm.$$

7.- $y = 1'5\,cm$



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

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

$$\frac{1}{s'} = \frac{s-f}{f\cdot s} \Rightarrow s' = \frac{f\cdot s}{s-f} = \frac{(10cm)\cdot(-15cm)}{(-15cm)-10cm}$$

$$s' = \frac{-150cm^2}{-25cm} = +6\,cm$$

$$y' = -y\,\frac{s'}{s} = -1'5cm\,\frac{(6cm)}{(-15cm)} = +0'6\,cm$$

Non compte son virtuals

8.- O mesmo que o 7.

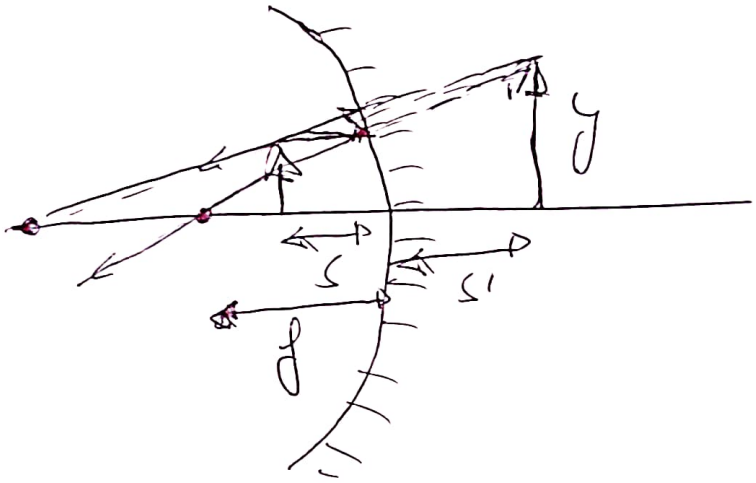
9.-

Espello concavo

$y = 3\,cm.$

$s = 8\,cm.$

$s' = 10\,cm.$ a <u>dereita</u> do espello



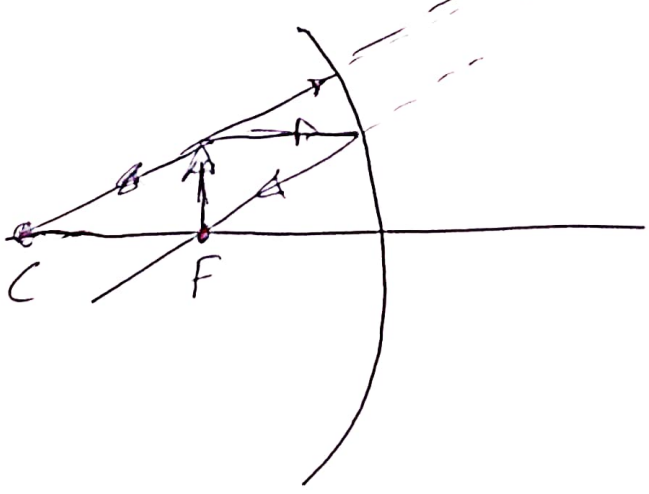
$$\frac{1}{s'} + \frac{1}{s} = \frac{1}{f'} \qquad \frac{y'}{y} = -\frac{s'}{s}$$

$$f' = \frac{g+s'}{} \quad \text{ou} \quad f' = \frac{s' \cdot s}{s+s'} = \frac{(10\,cm)(-8\,cm)}{10\,cm - 8\,cm} = \frac{-80\,cm^2}{2\,cm}$$

$$f' = -40\,cm.$$

$$y' = -y\frac{s'}{s} = -3\,cm.\ \frac{10\,cm}{(-8\,cm)} = +3'75\,cm.$$

c)

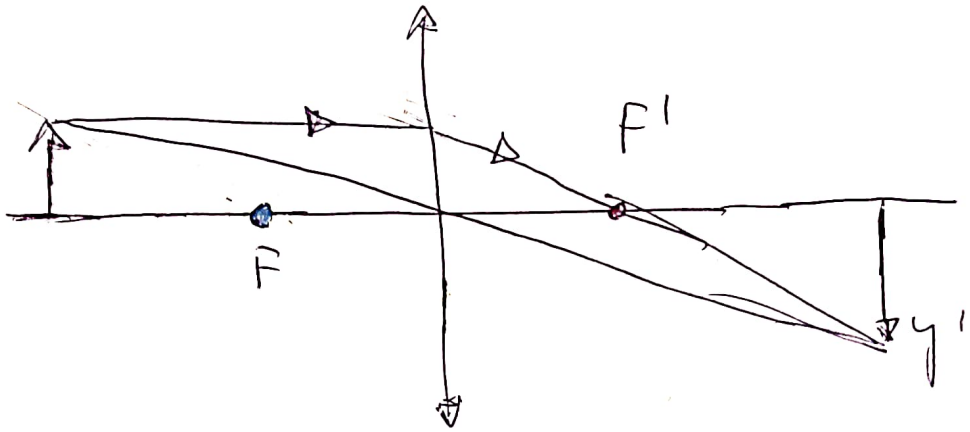


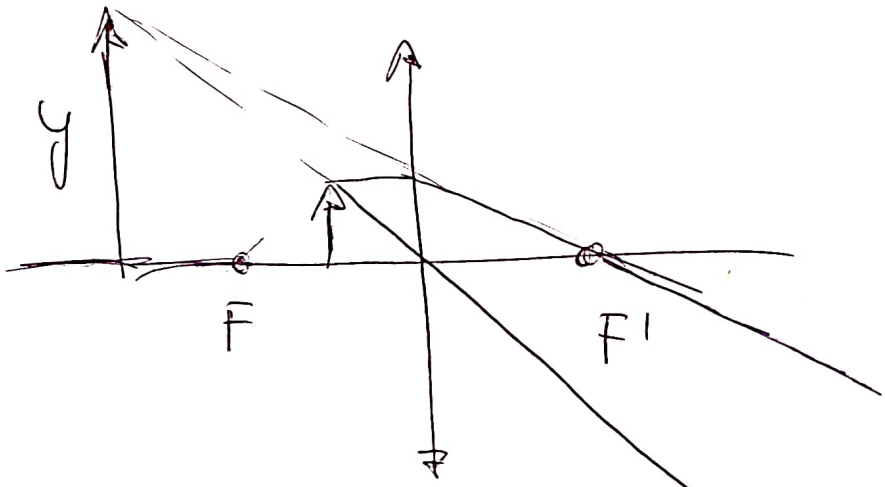
NO FOCO

5o.- $y = 3cm$

$s = 75cm$

$s' = +37'5cm$





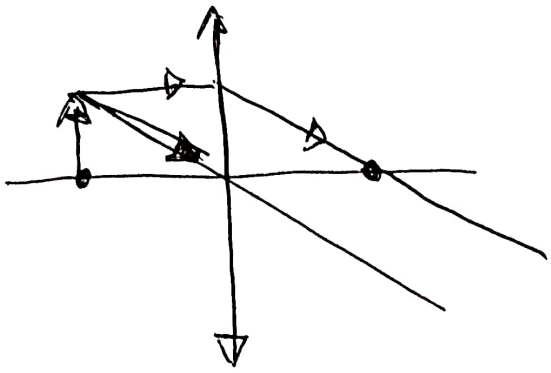
por detras do foco debe estar o obxecto.

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

$$f' = \frac{(-75cm) \cdot (37'5cm)}{-75cm - 37'5cm} = 25'0\ cm.$$

$$y' = y \frac{s'}{s} \Rightarrow y' = 3cm \cdot \frac{37'5cm}{-75cm} = -1'5cm.$$

c)



líñas paralelas

Analíticamente

$$\frac{1}{s'} - \frac{1}{s} = \frac{1}{f'} = 0 \quad s' = \frac{s \cdot f'}{s + f'} \Bigg\} \; s' = \frac{s \cdot f'}{0} = \infty$$

$\downarrow$

$s = -f'$