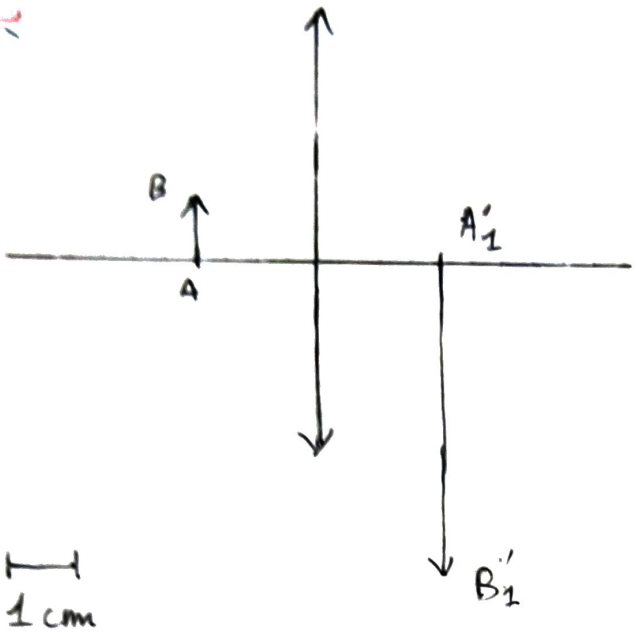
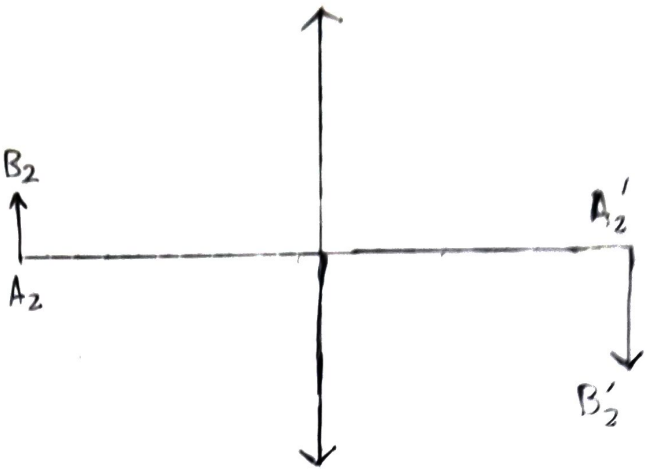
EXERCICE 1





$\{\overline{OA}, f'\}$: inconnues.

$$\gamma_1 = \frac{\overline{A_1'B_1'}}{\overline{A_1B_1}} = \frac{\overline{OA_1'}}{\overline{OA}} = -5$$

$$\frac{1}{\overline{OA_1'}} - \frac{1}{\overline{OA}} = \frac{1}{f'}$$

ie $1 - (-5) = \dfrac{\overline{OA_1'}}{f'}$

ie $\dfrac{1}{6} = \dfrac{f'}{\overline{OA_1'}}$

ie $-\dfrac{5}{6}\overline{OA} = f'$

$$\gamma_2 = \frac{\overline{OA_2'}}{\overline{OA}} = -2$$

$$\frac{1}{\overline{OA_2'}} - \frac{1}{\overline{OA_2}} = \frac{1}{f'}$$

ie $1 - (-2) = \dfrac{\overline{OA_2'}}{f'}$

ie $\dfrac{1}{3} = \dfrac{f'}{\overline{OA_2}}$

ie $-\dfrac{2}{3}\overline{OA_2} = f'$

ie $-\dfrac{2}{3}(\overline{OA} - 3) = f'$

$$\begin{cases} -\frac{5}{6}\overline{OA} = f' \\ -\frac{2}{3}(\overline{OA} - 3) = f' \end{cases}$$

$$-\frac{5}{6}\overline{OA} = -\frac{2}{3}\overline{OA} + 2$$

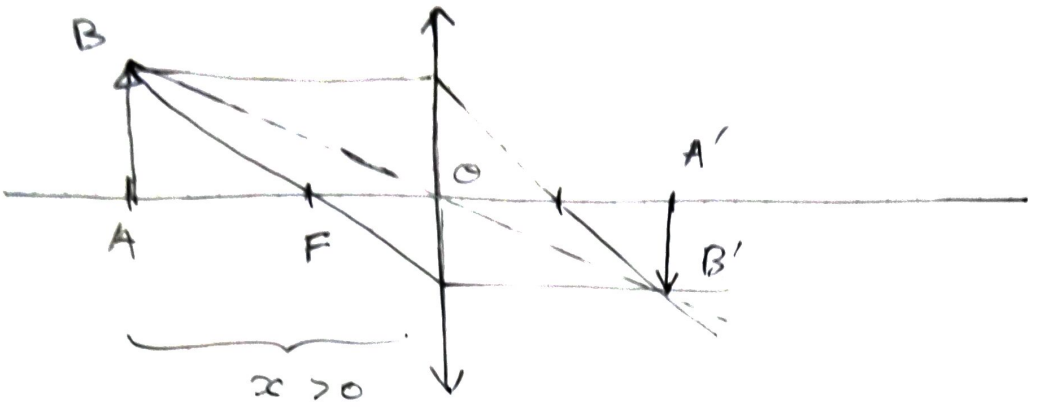
ie $\left(-\frac{5}{6} + \frac{2}{3}\right)\overline{OA} = 2$

ie $\left(\frac{-5+4}{6}\right)\overline{OA} = 2$

ie $\overline{OA} = -12$ cm

donc $f' = -\frac{5}{6}(-12) = +10$ cm

4



$$\frac{1}{\overline{OA'}} - \frac{1}{\overline{OA}} = \frac{1}{f'} \qquad \text{ie} \quad \overline{OA'} = \left(\frac{1}{f'} + \frac{1}{\overline{OA}}\right)^{-1}$$

Expressions D

$$D = \overline{AA'} = \overline{AO} + \overline{OA'}$$

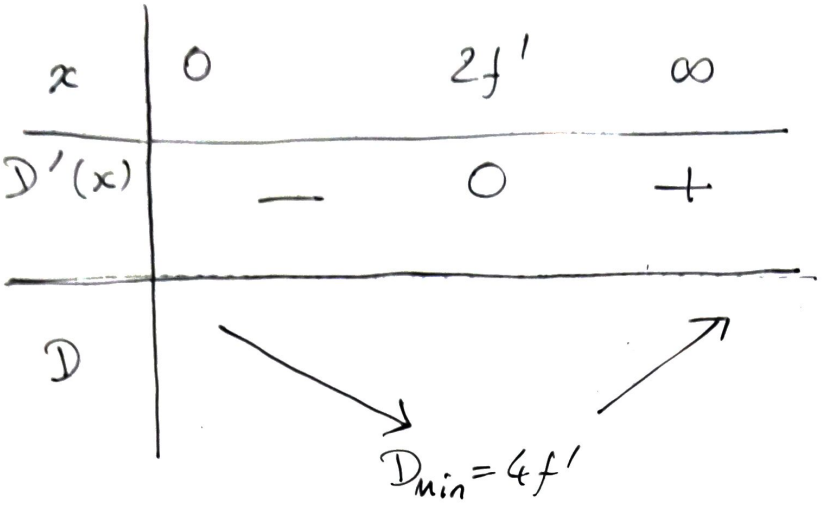
$$= x + \overline{OA'}$$

$$= x + \frac{1}{\frac{1}{f'} + \frac{1}{\overline{OA}}}$$

$$= x + \frac{1}{\frac{1}{f'} + \frac{1}{-x}}$$

$$= \frac{\frac{x}{f'} - 1 + 1}{\frac{1}{f'} + \frac{1}{-x}}$$

$$= \frac{x}{1 + \frac{f'}{-x}} = \frac{x^2}{x - f'}$$


x
0
2f'
∞
D'(x)
—
0
+
D
D_min = 4f'