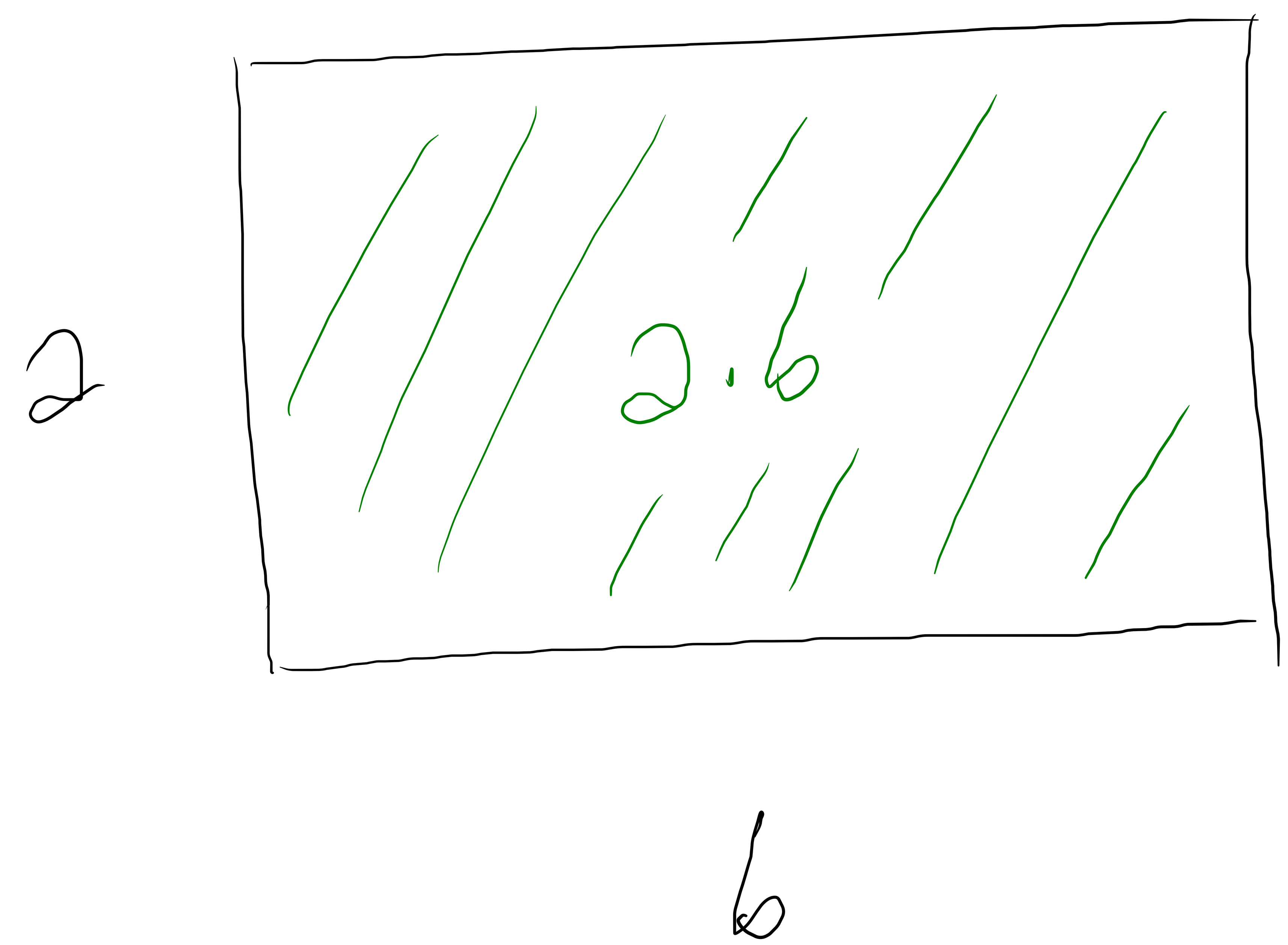
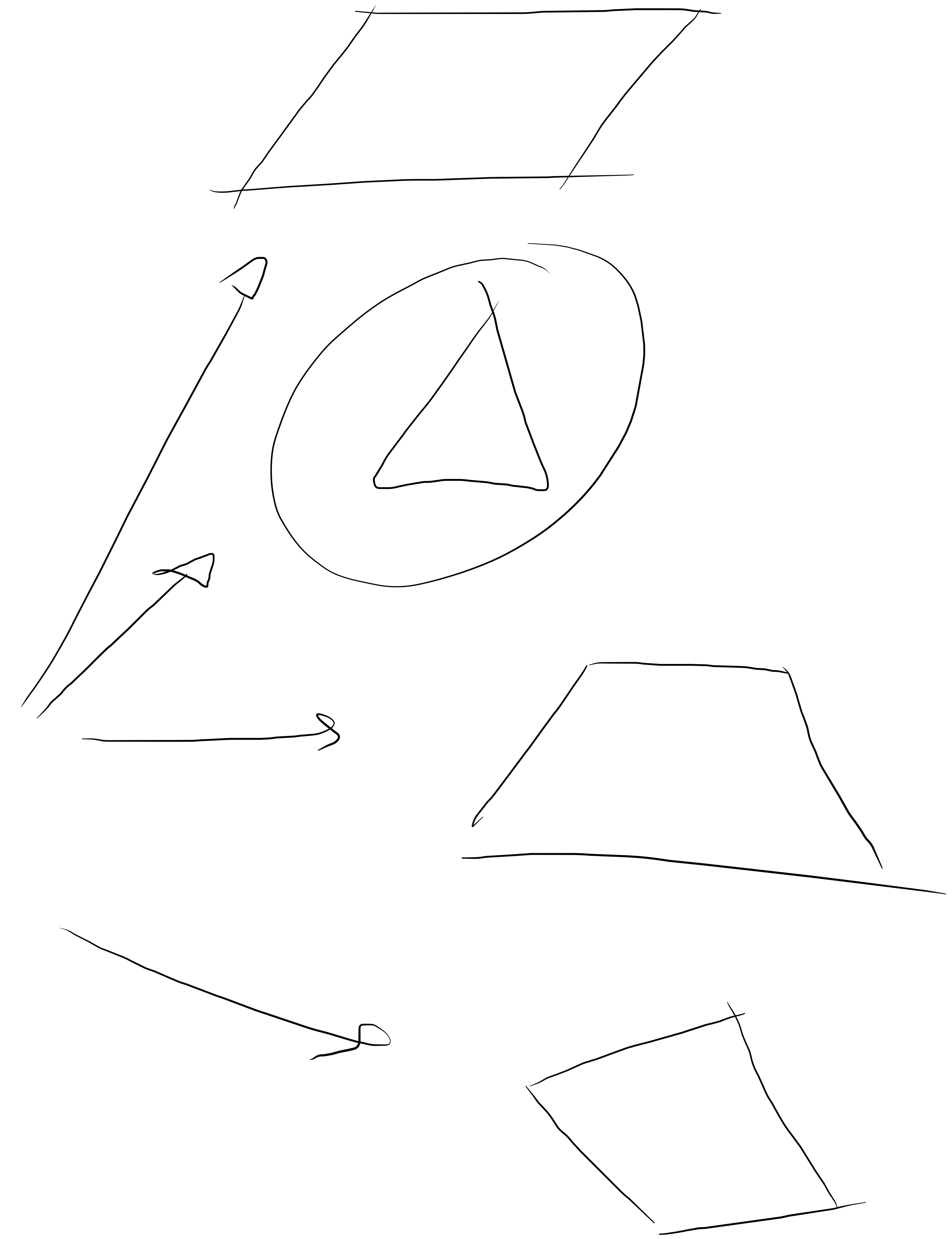
Intégrale comme aire



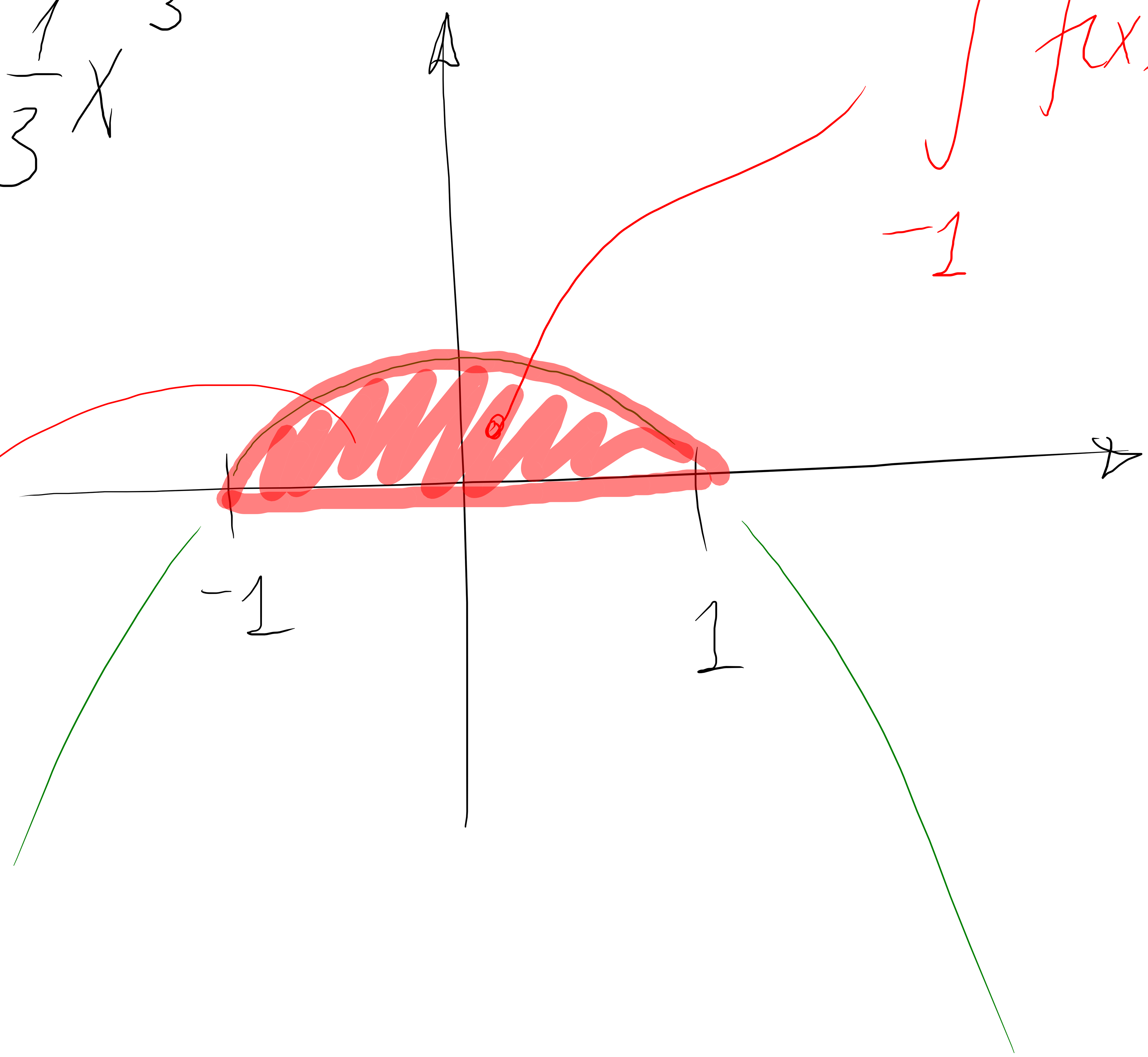


$$f(x) = 1 - x^2$$

$$F(x) = x - \frac{1}{3}x^3$$

$$\int_{-1}^{1} f(x)\,dx = F(1) - F(-1) = 1 - \frac{1}{3} - \left(-1 - \frac{1}{3}(-1)\right)$$

$$= F(x)\Big|_{-1}^{1} = \frac{2}{3} + \frac{2}{3} = \frac{4}{3}$$



$$A = \frac{4}{3}\,cm^2$$

$$F'(x) = f(x)$$

$$F(x) = \int f(x)\,dx$$

$$x_1 \cdot \begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix} + x_2 \cdot \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix} + x_3 \cdot \begin{pmatrix} m \\ -1 \\ 2 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 1 & m & 0 \\ 2 & -1 & -1 & 0 \\ -1 & 3 & 2 & 0 \end{pmatrix} \sim \begin{pmatrix} 1 & 1 & m & 0 \\ 0 & -3 & -1-2m & 0 \\ 0 & 4 & m+2 & 0 \end{pmatrix}$$

$$\sim \begin{pmatrix} 1 & 1 & m & 0 \\ 0 & 1 & \frac{2m+1}{3} & 0 \\ 0 & 1 & \frac{m+2}{4} & 0 \end{pmatrix} \sim \begin{pmatrix} 1 & 1 & m & 0 \\ 0 & 1 & \frac{2m+1}{3} & 0 \\ 0 & 0 & \underbrace{\boxed{\frac{m+2}{4} - \frac{2m+1}{3}}}_{=0} & 0 \end{pmatrix}$$

Si $3m+6-8m-4=0$, le système admet au moins une solution (x_1, x_2, x_3) non nulle. Il faut donc $2 = 5m \Leftrightarrow m = \frac{2}{5}$