$$\boxed{f(x) = x^3 - 2x^2 - x + 2}$$

On cherche l'aire du domaine limité par le graphe de f et l'axe Ox.

$$f(x) = 0 \iff x^3 - 2x^2 - x + 2 = 0$$

$$\mathcal{D}_2 = \{\pm 1, \pm 2\}$$

$\boxed{x = 1}$ $\quad 1^3 - 2 \cdot 1^2 - 1 + 2 = 1 - 2 - 1 + 2$

$= 1 - 1 + 2 - 2 = 0$

$$x^3 - 2x^2 - x + 2 \;\Big|\; \underline{x - 1}$$

0

Schéma de Horner:

	1	-2	-1	2
1		1	-1	-2
	1	-1	-2	0

$$(x^2 - x - 2)(x - 1) = x^3 - 2x^2 - x + 2$$

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

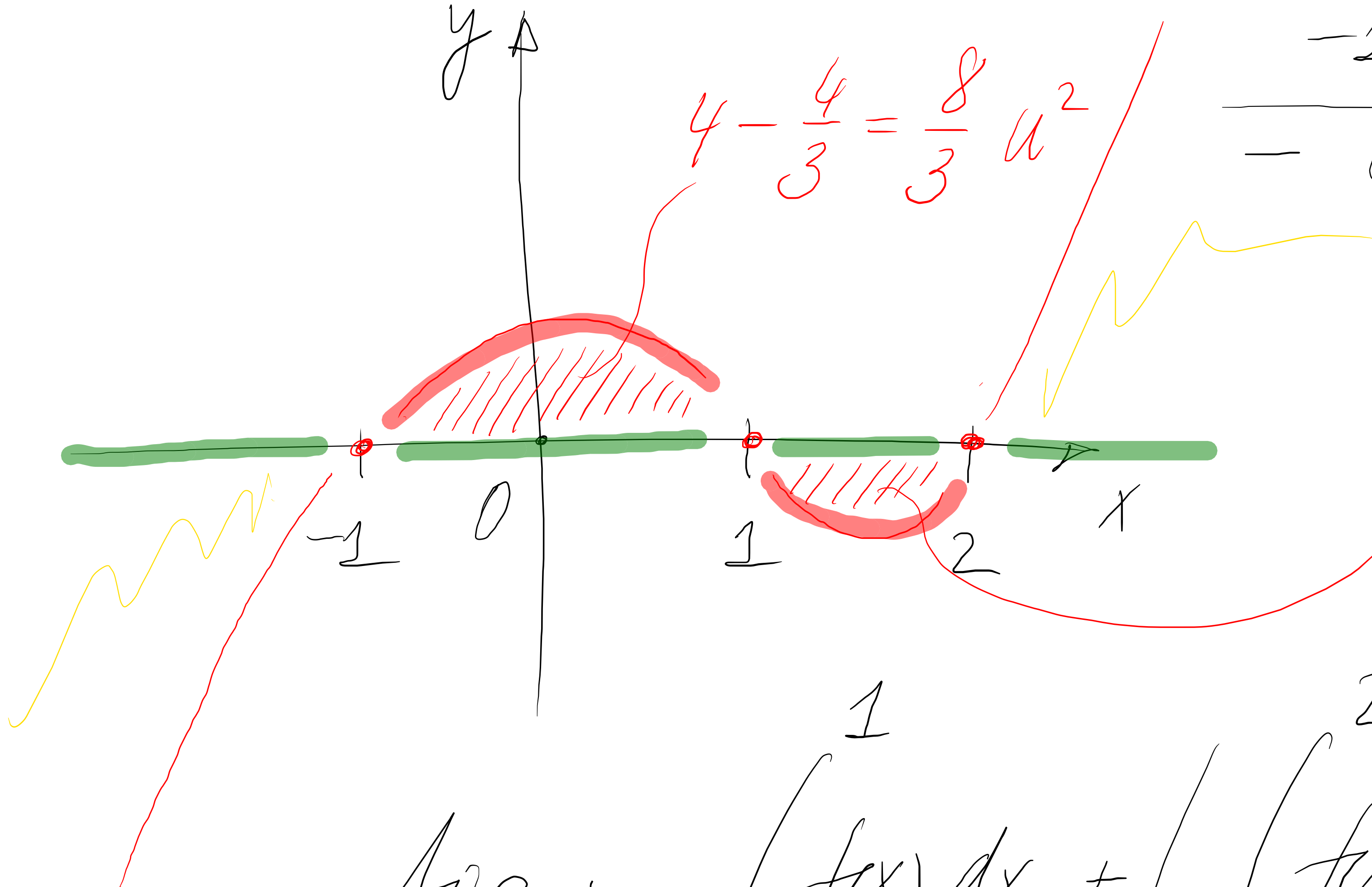
$+1-2=-1$ $\quad$ $1 \cdot (-2)$

$$\Rightarrow x^3 - 2x^2 - x + 2 = 0$$

$$\Leftrightarrow (x+1)(x-2)(x-1) = 0$$

$$\Rightarrow f(x) = 0 \Leftrightarrow x=1 \;/\; x=-1 \;/\; x=2$$

x		-1		1		2	
	$-$	0	$+$	0	$-$	0	$+$



$4 - \frac{4}{3} = \frac{8}{3}\ u^2$

$\left|-\frac{5}{12}\right| = \frac{5}{12}\ u^2$

Aire : $\int_{-1}^{1} f(x)\,dx + \left|\int_{1}^{2} f(x)\,dx\right|$

$$\int f(x)\,dx = \int (x^3 - 2x^2 - x + 2)\,dx \qquad \int x^n\,dx = \frac{1}{n+1}x^{n+1} + C$$

$$= \frac{1}{4}x^4 - \frac{2}{3}x^3 - \frac{1}{2}x^2 + 2x + C$$

Calcul de l'aire :

$$\int_{-1}^{1} f(x)\,dx = \left[\frac{1}{4}x^4 - \frac{2}{3}x^3 - \frac{1}{2}x^2 + 2x\right]_{-1}^{1} = \left(\cancel{\frac{1}{4}} - \frac{2}{3} - \cancel{\frac{1}{2}} + 2\right) - \left(\cancel{\frac{1}{4}} + \frac{2}{3} - \cancel{\frac{1}{2}} - 2\right)$$

$$= -\frac{4}{3} + 4 = 4 - \frac{4}{3}$$

$$\int_1^2 f(x)\,dx = \frac{1}{4}x^4 - \frac{2}{3}x^3 - \frac{1}{2}x^2 + 2x \Bigg|_1^2$$

$$= \left(\frac{1}{4}16 - \frac{2}{3}8 - \frac{1}{2}4 + 4\right) - \left(\frac{1}{4} - \frac{2}{3} - \frac{1}{2} + 2\right)$$

$$= \left(\cancel{4} - \cancel{\frac{16}{3}} \cancel{-2} \cancel{+4}\right) - \frac{1}{4} + \cancel{\frac{2}{3}} + \frac{1}{2} \cancel{-2} = 4 - \frac{14}{3} + \frac{1}{4}$$

$$= \frac{48 - 56 + 3}{12} = -\frac{5}{12}$$

Aire cherchée : $\frac{8}{3} + \frac{5}{12} = \frac{37}{12} \simeq 3,\ldots$