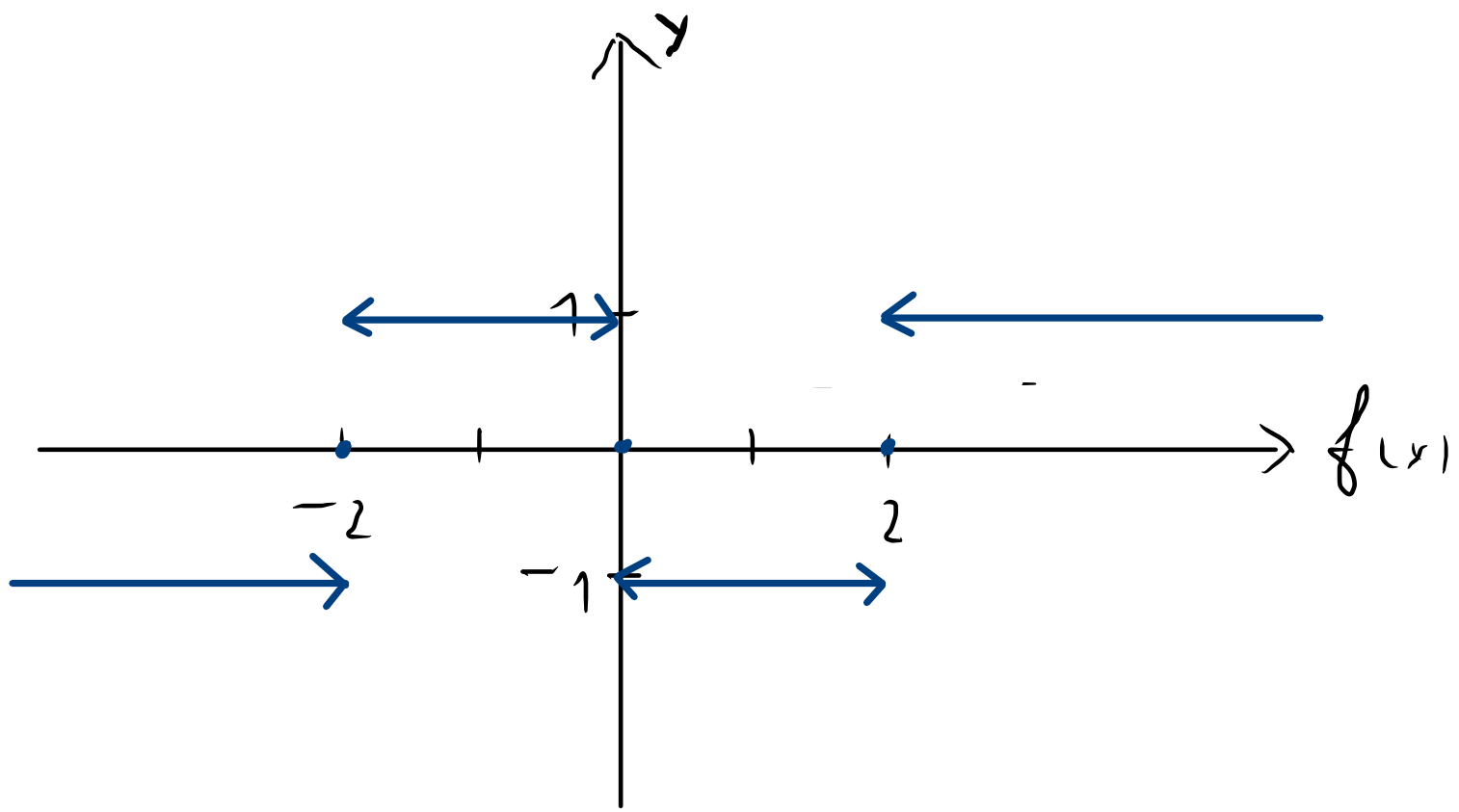
2.2.13 26.09.19

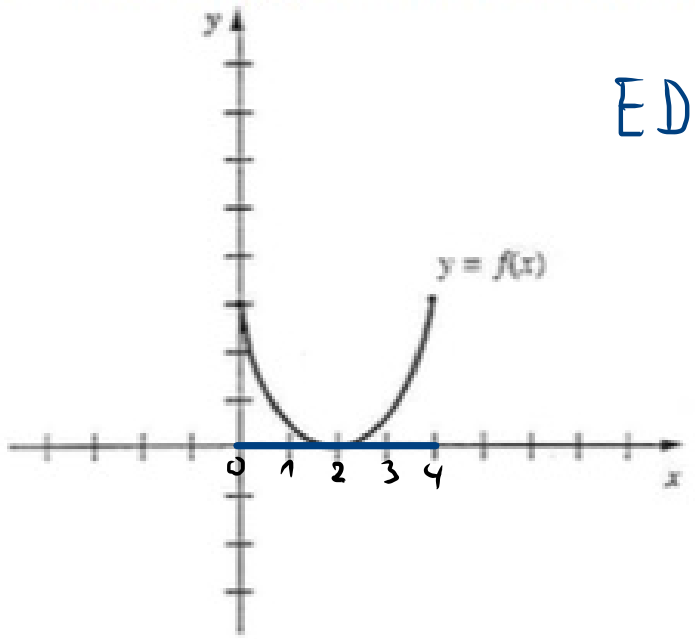
d) $f(x) = \operatorname{sgn}(x^3 - 4x)$

$$x(x^2-4) = x(x-2)(x+2)$$

x		-2		0		2	
x^3-4x	$-$	0	$+$	0	$-$	0	$+$



2.2.14 Dans le système d'axes ci-dessous, esquisser les courbes :



$ED(f) = [0, 4]$

a) $y = f(\overbrace{x+3}^{t \in [0;4]})$ $[-3; 1]$

b) $y = f(x-3)$

c) $y = f(x)+3$

d) $y = f(x)-3$

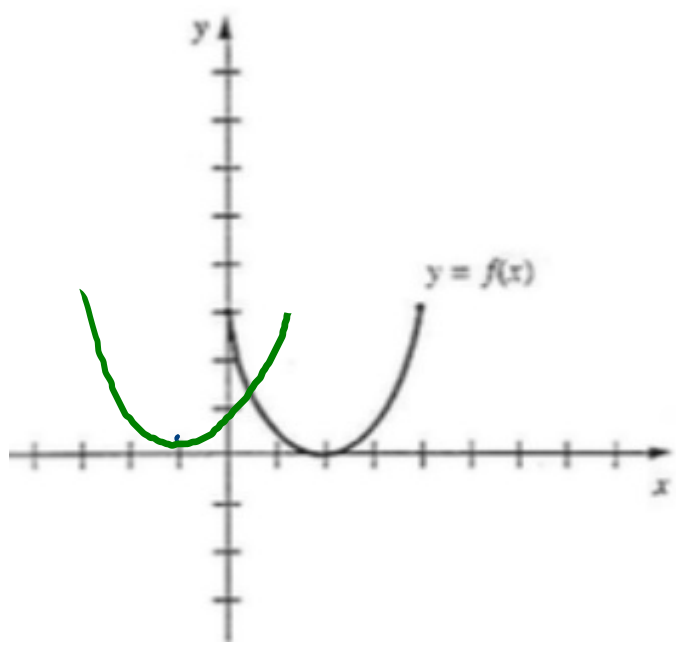
e) $y = -3f(x)$

f) $y = -\frac{1}{3}f(x)$

g) $y = -f(x+2)-3$

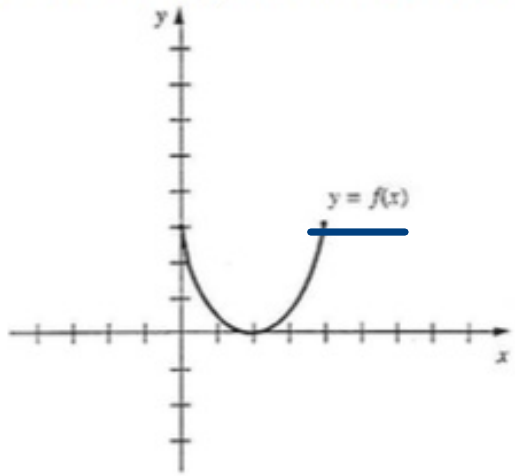
h) $y = f(x-2)+3$

a)



x	$f(x)$
0	3
2	0
4	3

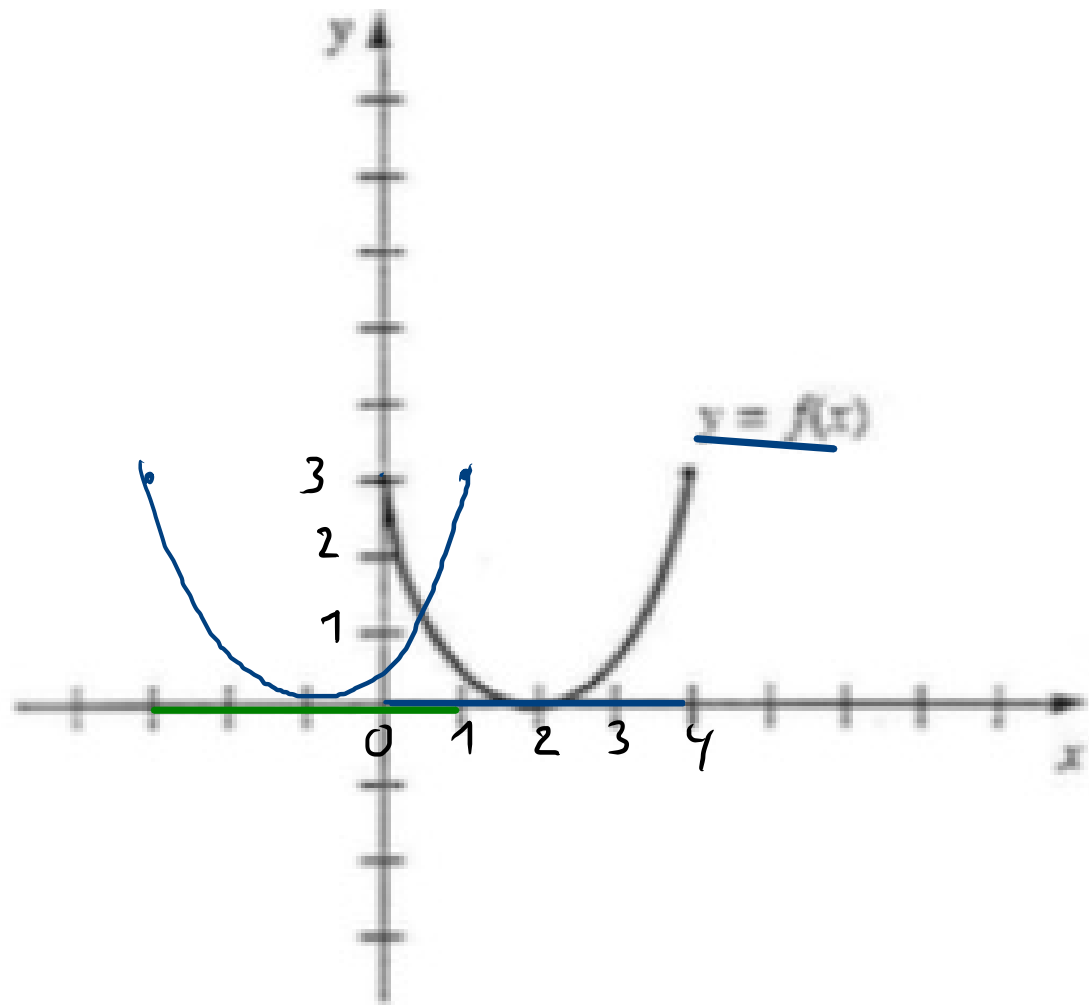
2.2.14 Dans le système d'axes ci-dessous, esquisser les courbes :



a) $y = f(x+3)$
b) $y = f(x-3)$
c) $y = f(x)+3$
d) $y = f(x)-3$
e) $y = -3f(x)$
f) $y = -\frac{1}{3}f(x)$
g) $y = -f(x+2)-3$
h) $y = f(x-2)+3$

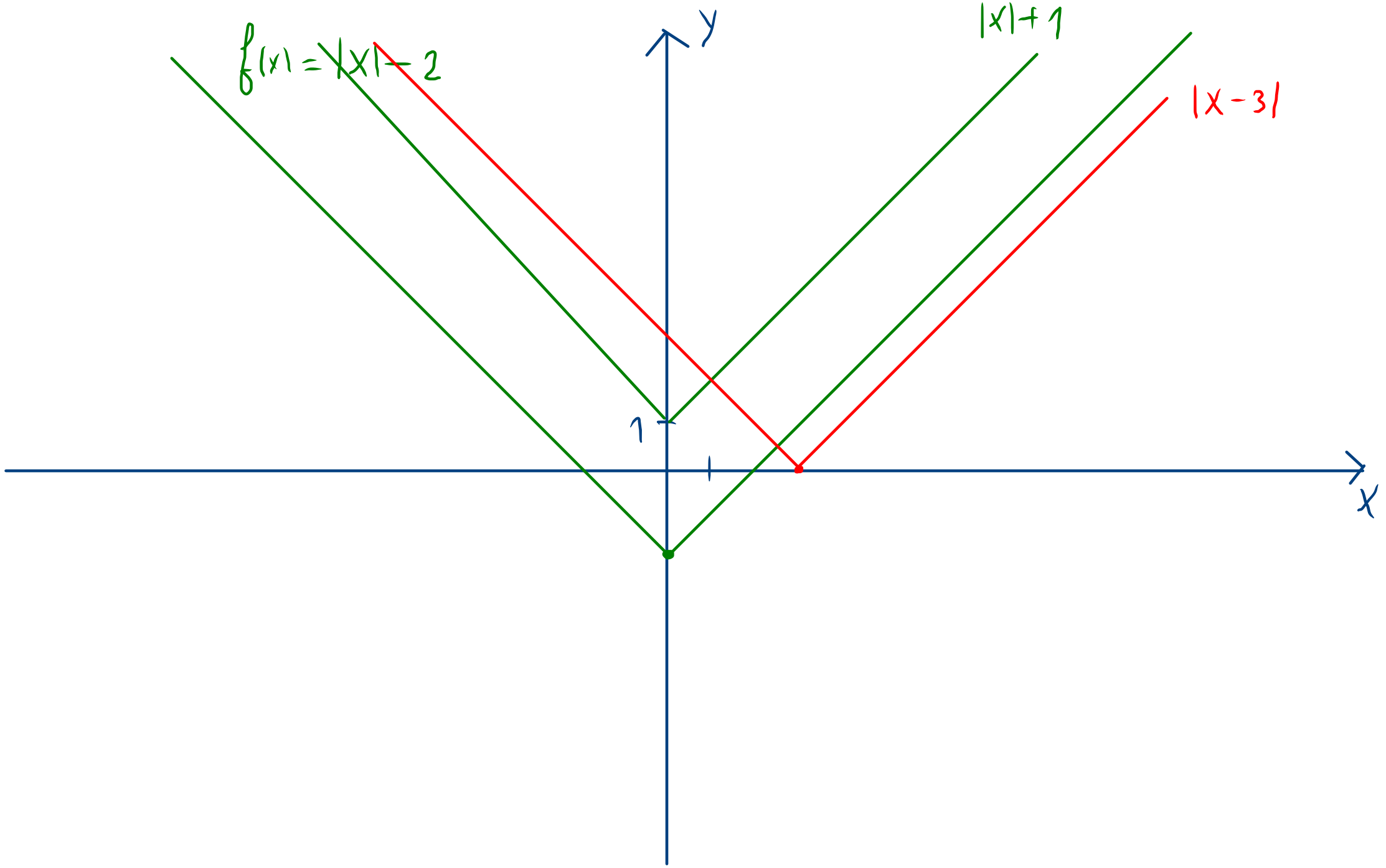
$y = f(t+3)$

$[-3 ; 1]$



2.2.15 Tracer le graphe des fonctions suivantes :

a) $f(x) = |x| - 2$, $g(x) = |x| + 1$, $h(x) = |x - 3|$, $k(x) = |x + 1|$ et $l(x) = -|x| + 1$

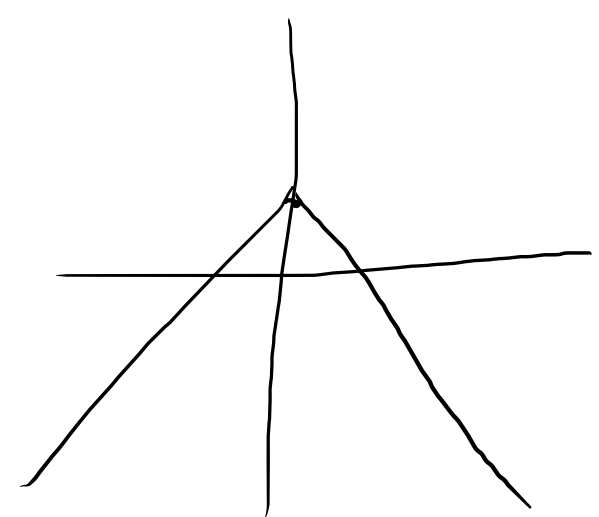


$$f(x) = |x| - 2 \qquad ED(f) = \mathbb{R}$$

$$f(x) = \begin{cases} x - 2 & x \geq 0 \\ -x - 2 & x < 0 \end{cases}$$

$$|x-3| = \begin{cases} x - 3 & \text{si } x \geq 3 \\ -x + 3 & \text{si } x < 3 \end{cases}$$

$$-|x| + 1 = \begin{cases} -x + 1 & \text{si } x \geq 0 \\ x + 1 & \text{si } x < 0 \end{cases}$$

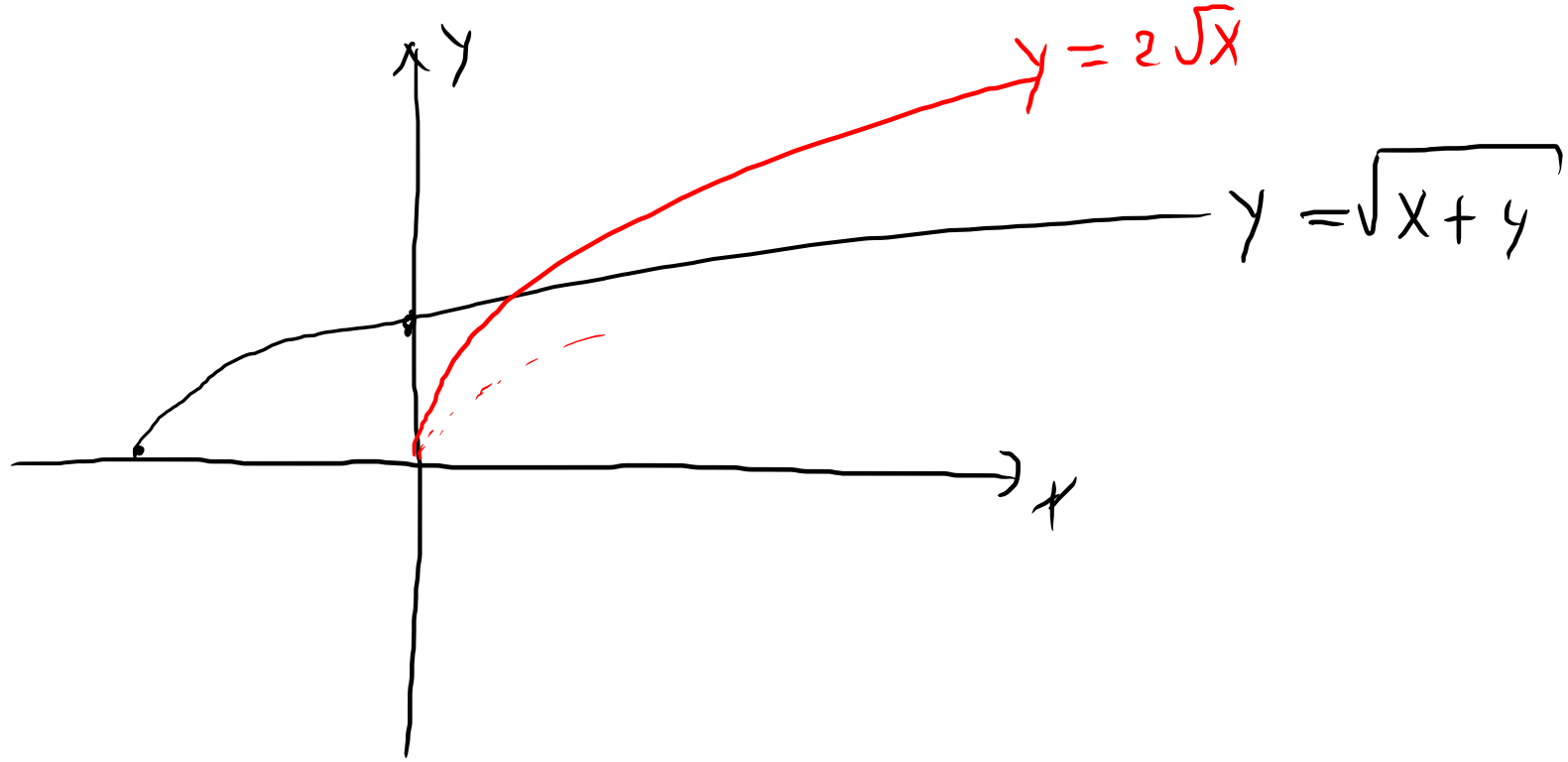


b) $f(x) = \sqrt{x+4}$, $g(x) = 2\sqrt{x}$ et $h(x) = \sqrt{x-1} - 4$

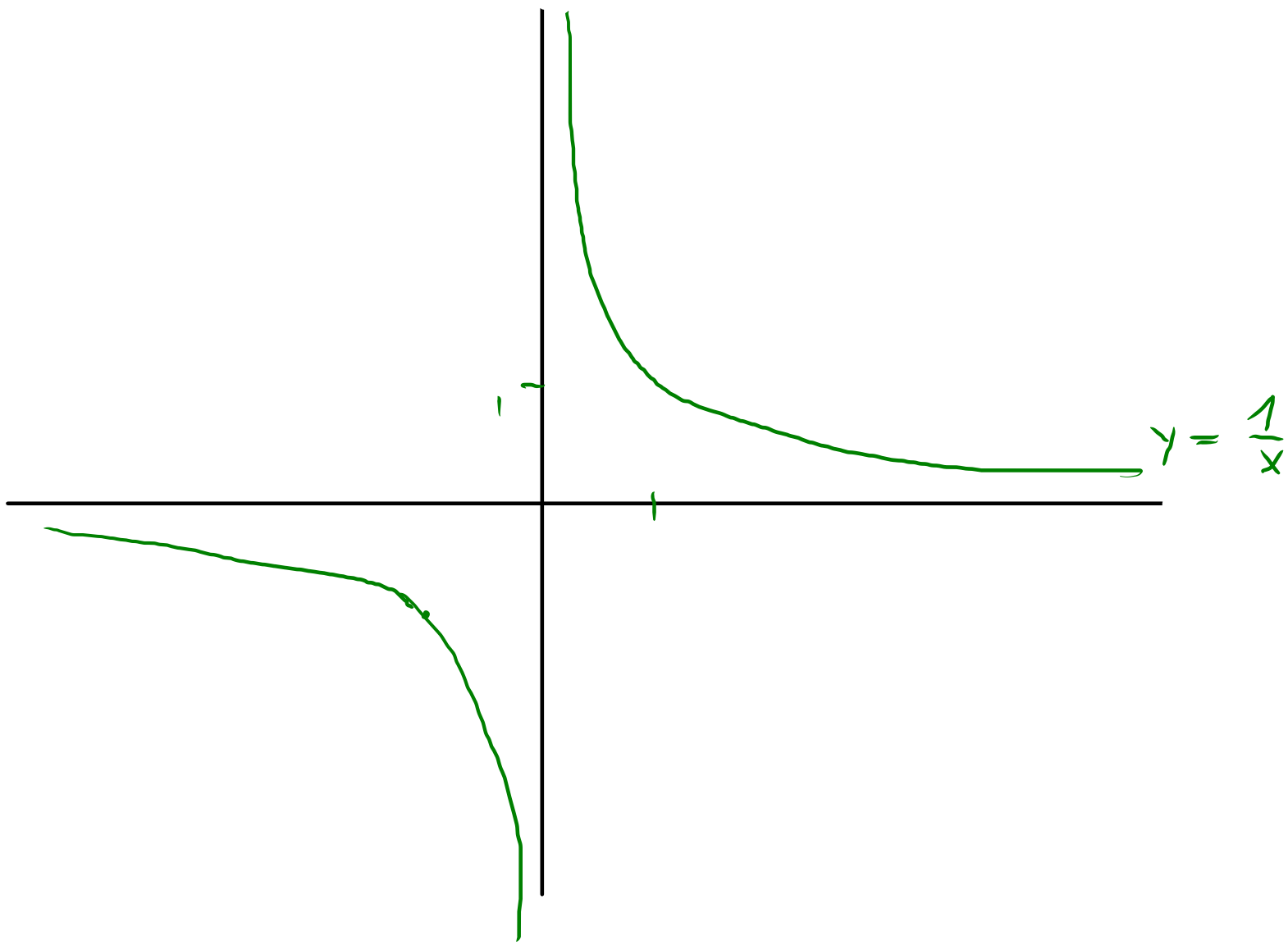
$y = \sqrt{x+4}$ $\qquad x \in [-4, +\infty[$

$y = [0 ; +\infty[$

$y^2 = x + 4 \Rightarrow x = y^2 - 4$



c) $f(x) = \frac{1}{x} - 3$ et $g(x) = \frac{1}{x-2}$



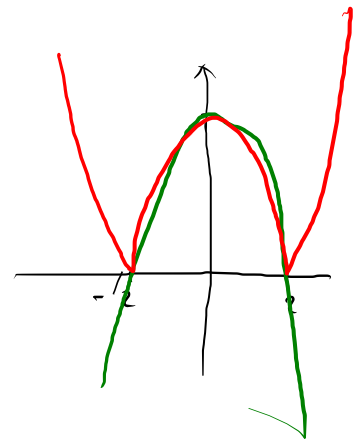
2.2.16 Tracer le graphe des fonctions suivantes :

a) $f(x) = |4 - x^2|$ b) $f(x) = ||x+4| - 2| + 1$

c) $f(x) = |x^2 - 2x| - 1$ d) $f(x) = |x-1| + |x+2|$

a) $f(x) = |4 - x^2|$

x		-2		2	
$-x^2+4$	$-$	0	$+$	0	$-$



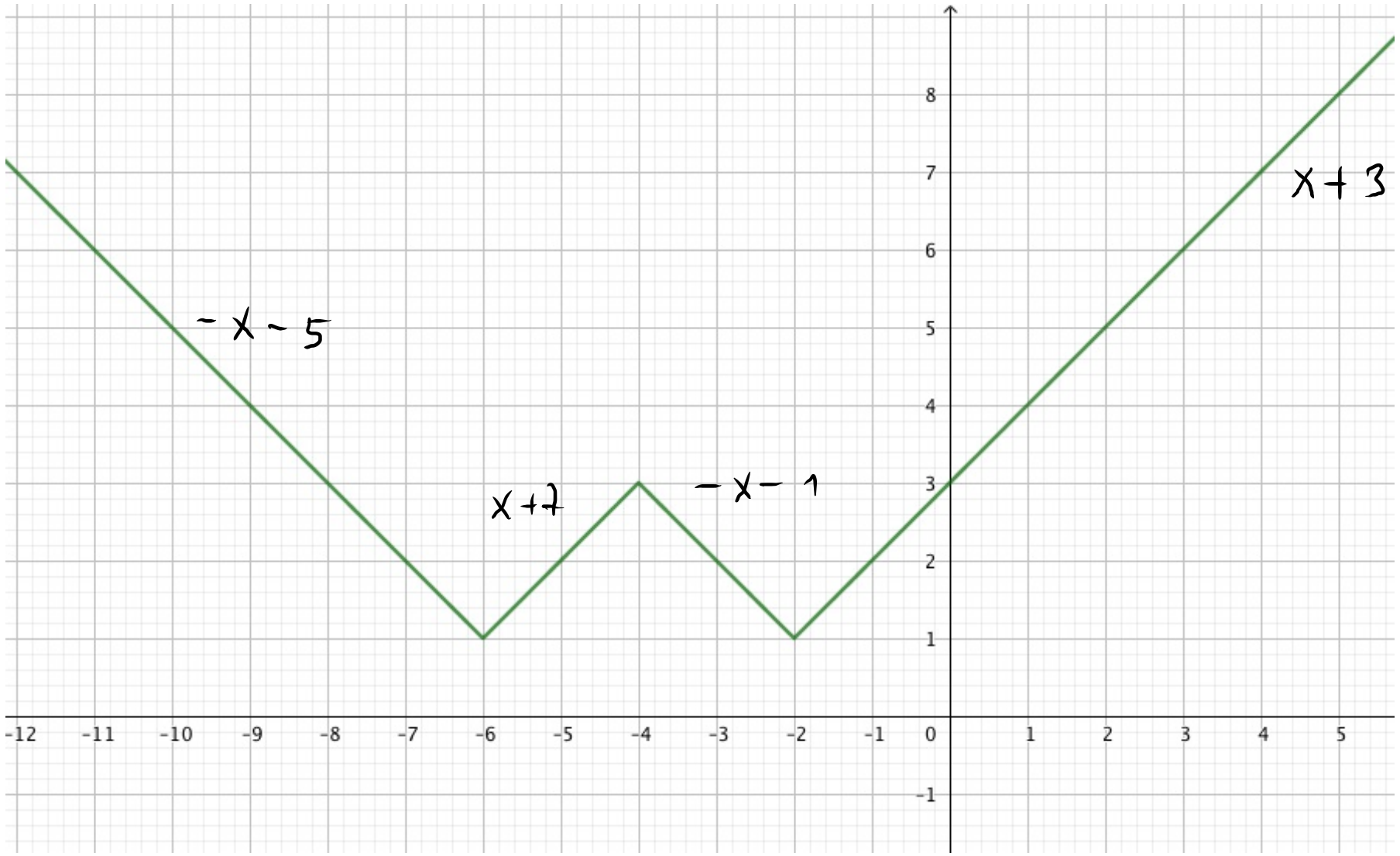
b) $f(x) = \Big| |x+4| - 2 \Big| + 1$

- $|x+4| = \begin{cases} x+4 & \text{si } x \geq -4 \\ -x-4 & \text{si } x < -4 \end{cases}$

- $|x+4| - 2 = \begin{cases} x+2 & \text{si } x \geq -4 \\ -x-6 & \text{si } x < -4 \end{cases}$

$\Big| |x+4| - 2 \Big| = \begin{cases} |x+2| = \begin{cases} x+2 & x \geq -2 \\ -x-2 & -4 \leq x < -2 \end{cases} \\ |-x-6| \begin{cases} x+6 & -6 \leq x < -4 \\ -x-6 & x < -6 \end{cases} \end{cases}$

$\Big| |x+4| - 2 \Big| + 1 = \begin{cases} x+3 & x \geq -2 \\ -x-1 & -4 \leq x < -2 \\ x+7 & -6 \; x < -4 \\ -x-5 & x < -6 \end{cases}$


-x-5
x+7
-x-1
x+3
8
7
6
5
4
3
2
1
-1
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5