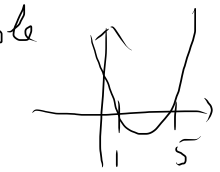
29.09.22

c) $f(x) = \sqrt{(x-1)(x-5)}$

conditions $(x-1)(x-5) \geqslant 0$

Déterminons le tableau des signes $\underbrace{(x-1)(x-5)}_{\text{parabole}}$



x	$-\infty$		1		5		$+\infty$
$(x-1)(x-5)$		$+$	0	$-$	0	$+$	

$ED(f) = \left]-\infty; 1\right] \cup \left[5; +\infty\right[$

d) $f(x) = \dfrac{\sqrt{6-2x}}{x^2-5x+4}$

Conditions : 1) $6-2x \geqslant 0$

2) $x^2-5x+4 \neq 0$

1) $6 \geqslant 2x$ | $\Leftrightarrow$

$2x \leqslant 6$ | $\div 2$

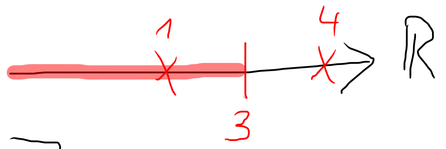
$x \leqslant 3$

2) $x^2 - 5x + 4 = 0$

$(x-1)(x-4) = 0$

$\downarrow$ $x = 1$ $\downarrow$ $x = 4$

Donc : $x \neq 1$; $x \neq 4$



$ED = \left]-\infty; 1\right[\cup \left]1; 3\right]$ beau 

$= \left]-\infty; 3\right] - \{1\}$ moche 

2.2.3 Déterminer l'ensemble de définition des fonctions suivantes :

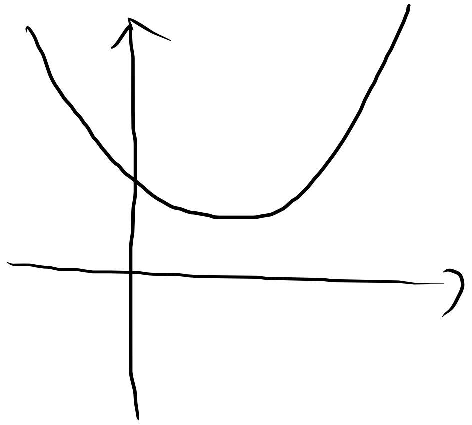
a) $f(x) = \sqrt{x^2 + x + 1}$

b) $f(x) = \sqrt{x-1}\sqrt{x-5}$

a) $\underbrace{x^2 + x + 1}_{p(x)} \geq 0$

$p(x) = 0 \iff x^2 + x + 1 = 0$

$\Delta = 1 - 4 = -3 < 0$



$\underline{ED(f) = \mathbb{R}}$

b) $\begin{cases} x - 1 \geq 0 \\ x - 5 \geq 0 \end{cases} \iff \begin{cases} x \geq 1 \\ x \geq 5 \end{cases}$

$\underline{ED(f) = [5; \infty[}$

e) $f(x) = \sqrt{\dfrac{x+1}{x-4}}$

f) $f(x) = \dfrac{x^2+7x}{\sqrt{1-x^2}}$

e) Signe de $\dfrac{x+1}{x-4}$:

x	$-\infty$		-1		4		$+\infty$
$\dfrac{x+1}{x-4}$		$+$	0	$-$	$\|\|$	$+$	

$ED(f) =]-\infty ; -1] \cup]4 ; +\infty[$

f) conditions: $1 - x^2 > 0$

$(1-x)(1+x) > 0$

Signe de $(1-x)(1+x)$:

x		-1		1	
$(1-x)(1+x)$	$-$	0	$+$	0	$-$

$ED(f) =]-1 ; 1[$