1) $\dfrac{|x-2|}{|x+|x||} - 1 < 0$

$$\frac{|x-2| - |x+|x||}{|x+|x||} < 0$$

$N > 0 \quad |x-2| - |x+|x|| > 0$

$x - 2 \geq 0$

$x \geq 2$

	2	
$-$		$+$

$x + |x| \geq 0$

$x \geq 0$

	0	
$-$		$+$

$\begin{cases} x < 0 \\ x - x \geq 0 \end{cases} \quad S_1 = (-\infty, 0)$

$\begin{cases} x \geq 0 \\ x + x \geq 0 \end{cases} \quad S_2 = [0, +\infty)$

a) $\begin{cases} x < 2 \\ -x + 2 - x - |x| > 0 \end{cases}$

$\boxed{\begin{cases} x < 2 \\ -2x - |x| + 2 > 0 \end{cases}}$

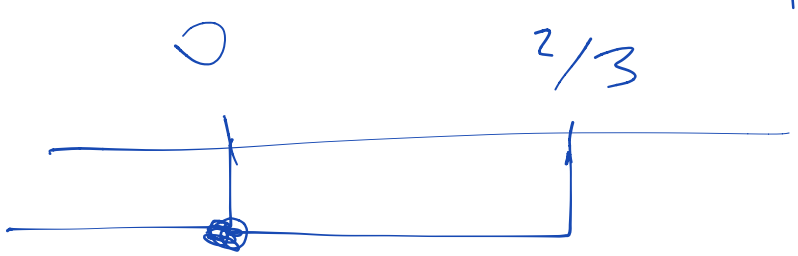
$a_1)$ $\begin{cases} x<0 \\ -2x+x+2>0 \end{cases}$ $\begin{cases} x<0 \\ -x>-2 \end{cases}$ $\begin{cases} x<0 \\ x<2 \end{cases}$

$\underline{x<0}$

$a_2)$ $\begin{cases} 0\leq x<2 \\ -3x+2>0 \end{cases}$ $\begin{cases} 0\leq x<2 \\ x<2/3 \end{cases}$

$\underline{0\leq x<2/3}$

$S=(-\infty, 2/3)$



2) $4-2|x+3|\geq -|x+3|$

$4-2\alpha \geq -\alpha$

$4-\alpha\geq 0$; $\alpha\leq 4$

$|x+3|\leq 4$ $-4\leq x+3\leq 4$

Equazioni irrazionali

$$\sqrt[n]{A(x)} = B(x)$$

Se n è pari

$$\sqrt{x-1} = 2x+3$$

$$\begin{cases} x-1 \geq 0 & \text{(C.E.)} \\ 2x+3 \geq 0 & \text{(conc. di segno)} \\ x-1 = (2x+3)^2 \end{cases}$$

$$\begin{cases} x \geq 1 \\ x \geq -3/2 \\ x-1 = 4x^2+12x+9 \end{cases} \qquad \begin{cases} x \geq 1 \\ 4x^2+11x+10=0 \end{cases}$$

$$b^2 = a \quad \begin{array}{l} \nearrow b = \sqrt{a} \\ \searrow b = -\sqrt{a} \end{array}$$

Disequazioni irrazionali

$$\sqrt{A(x)} \le B(x)$$

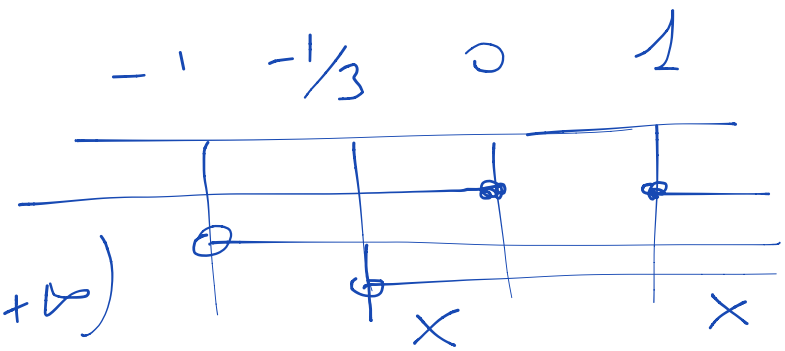
$$\begin{cases} A(x) \ge 0 \\ B(x) \ge 0 \\ A(x) \le [B(x)]^2 \end{cases}$$

$$\sqrt{A(x)} \ge B(x)$$

$$\begin{cases} A(x) \ge 0 \\ B(x) < 0 \end{cases} \cup \begin{cases} \cancel{A(x) \ge 0} \\ B(x) \ge 0 \\ A(x) \ge [B(x)]^2 \end{cases}$$

1) $\sqrt{x^2 - x} < x + 1$

$$\begin{cases} x^2 - x \ge 0 \\ x + 1 > 0 \\ \cancel{x^2} - x < \cancel{x^2} + 2x + 1 \end{cases} \qquad \begin{cases} x \le 0 \vee x \ge 1 \\ x > -1 \\ x > -1/3 \end{cases}$$



$$S = \left(-\tfrac{1}{3}; 0\right] \cup [1; +\infty)$$

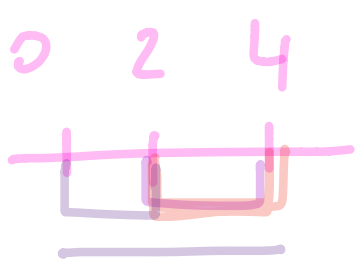
2) $2 < x + \sqrt{4-x}$ $\qquad$ $2 - x < \sqrt{4-x}$

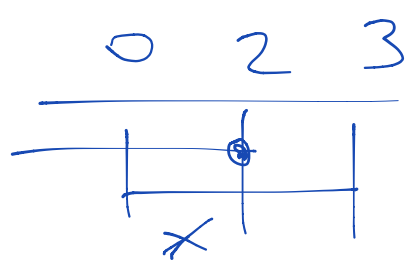
$\sqrt{4-x} > 2 - x$

$$\begin{cases} 4 - x \geq 0 \\ 2 - x < 0 \end{cases} \cup \begin{cases} 2 - x \geq 0 \\ \cancel{4} - x > \cancel{4} - 4x + x^2 \end{cases}$$

$$\begin{cases} x \leq 4 \\ x > 2 \end{cases} \cup \begin{cases} x \leq 2 \\ x^2 - 3x < 0 \end{cases}$$

$$\underline{2 < x \leq 4} \qquad \begin{cases} x \leq 2 \\ 0 < x < 3 \end{cases}$$





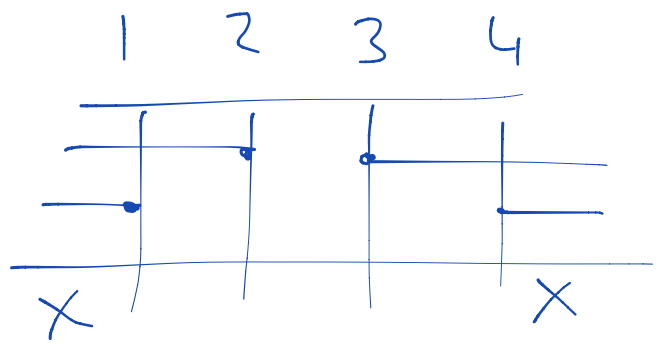
$$\underline{0 < x \leq 2}$$

$$S = (0, 4]$$

3) $\sqrt{x^2-5x+6} > \sqrt{x^2-5x+4}$

$$\begin{cases} x^2-5x+6 \geq 0 \\ x^2-5x+4 \geq 0 \\ \cancel{x^2}-5\cancel{x}+6 > \cancel{x^2}-\cancel{5x}+4 \end{cases} \qquad \begin{cases} (x-2)(x-3) \geq 0 \\ (x-4)(x-1) \geq 0 \\ 6 > 4 \end{cases}$$

$$\begin{cases} x \leq 2 \vee x \geq 3 \\ x \leq 1 \vee x \geq 4 \\ \forall x \in \mathbb{R} \end{cases}$$



$$S = (-\infty, 1] \cup [4, +\infty)$$

con una sola radice quadrata ed un polinomio a secondo membro	
$\sqrt{\boldsymbol{A}} > B \quad \rightarrow \quad \begin{cases} A \geq 0 \\ B < 0 \end{cases} \cup \begin{cases} B \geq 0 \\ A > B^2 \end{cases}$	$\sqrt{\boldsymbol{A}} < B \quad \rightarrow \quad \begin{cases} A \geq 0 \\ B > 0 \\ A < B^2 \end{cases}$
$\sqrt{\boldsymbol{A}} \geq \boldsymbol{B} \quad \rightarrow \quad \begin{cases} A \geq 0 \\ B < 0 \end{cases} \cup \begin{cases} B \geq 0 \\ A \geq B^2 \end{cases}$	$\sqrt{\boldsymbol{A}} \leq \boldsymbol{B} \quad \rightarrow \quad \begin{cases} A \geq 0 \\ B \geq 0 \\ A \leq B^2 \end{cases}$