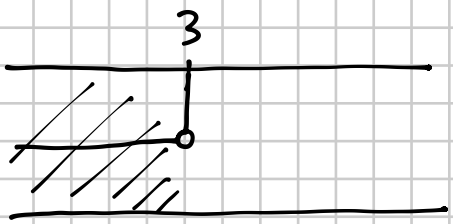
21/9/2021

793 $x - 3 < \sqrt{x^2 + x + 4}$

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

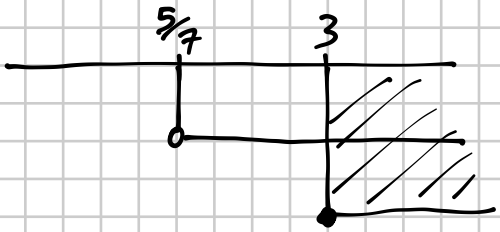
$$\begin{cases} x-3<0 \\ x^2+x+4 \geq 0 \\ \Delta = 1-16 < 0 \end{cases} \quad \vee \quad \begin{cases} x-3 \geq 0 \\ x^2+x+4 > x^2+9-6x \end{cases}$$

$$\begin{cases} x<3 \\ x \in \mathbb{R} \end{cases} \quad \vee \quad \begin{cases} x \geq 3 \\ 7x > 5 \\ x > \frac{5}{7} \end{cases}$$



$x < 3$

$\vee$



$x \geq 3$

$$\boxed{x \in \mathbb{R}} \qquad (\forall x \in \mathbb{R})$$

802 $\sqrt{x^2+5x-14} > \sqrt{x^2+4x+3}$ $[x > 17]$

$a, b \geq 0$

$a < b \Leftrightarrow a^2 < b^2$

1) $\begin{cases} x^2+5x-14 \geq 0 \\ x^2+4x+3 \geq 0 \\ x^2+5x-14 > x^2+4x+3 \end{cases}$

1) $x^2+5x-14 \geq 0$

$(x+7)(x-2) \geq 0$ $\quad x_1=-7,\ x_2=2$

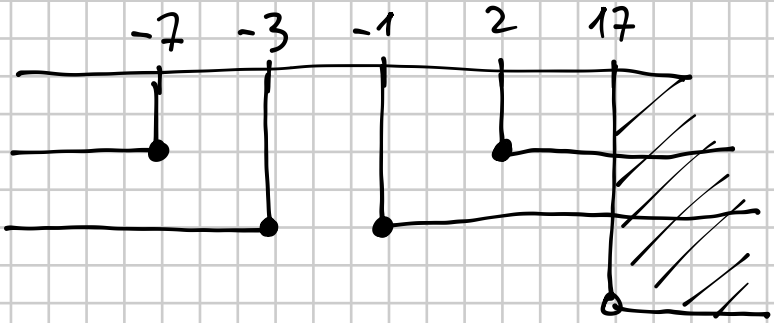
$x \leq -7 \vee x \geq 2$

2) $x^2+4x+3 \geq 0$

$(x+1)(x+3) \geq 0$ $\quad x_1=-1,\ x_2=-3$

$x \leq -3 \vee x \geq -1$

$\begin{cases} x \leq -7 \vee x \geq 2 \\ x \leq -3 \vee x \geq -1 \\ x > 17 \end{cases}$



$x > 17$

808 $\sqrt{x-1} > \sqrt{2x-1} - 1$

$$\sqrt{x-1} + 1 > \sqrt{2x-1}$$

$$\begin{cases} x-1 \geq 0 \\ 2x-1 \geq 0 \\ x-1+1+2\sqrt{x-1} > 2x-1 \end{cases} \qquad \begin{cases} x \geq 1 \\ x \geq \frac{1}{2} \\ 2\sqrt{x-1} > x-1 \end{cases}$$

$$\begin{cases} x-1 < 0 \\ x-1 \geq 0 \end{cases} \vee \begin{cases} x-1 \geq 0 \\ 4(x-1) > (x-1)^2 \end{cases}$$

$\emptyset$

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

$$\begin{cases} x \geq 1 \\ x \geq \frac{1}{2} \\ 1 < x < 5 \end{cases}$$

$$\boxed{1 < x < 5}$$

810 $\sqrt{x}+\sqrt{x-4}>\sqrt{2x-1}$

$$\begin{cases} x\geq 0 \\ x-4\geq 0 \\ 2x-1\geq 0 \end{cases} \Rightarrow x\geq 4$$

$$x+(x-4)+2\sqrt{x(x-4)}>2x-1$$

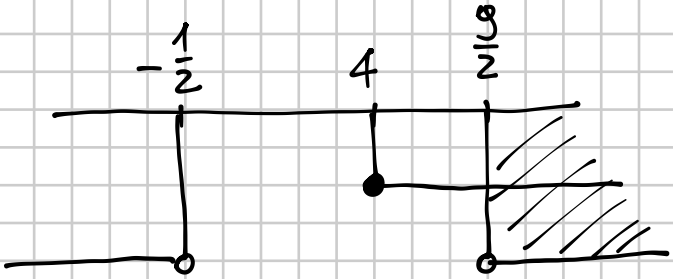
$$\begin{cases} x\geq 4 \\ 2x-4+2\sqrt{x^2-4x}>2x-1 \end{cases} \qquad \begin{cases} x\geq 4 \\ 2\sqrt{x^2-4x}>3 \end{cases}$$

$$\begin{cases} x\geq 4 \\ 4(x^2-4x)>9 \end{cases} \qquad \begin{cases} x\geq 4 \\ 4x^2-16x-9>0 \end{cases}$$

$$\frac{\Delta}{4}=64+36=100$$

$$x=\frac{8\pm 10}{4}=\begin{cases} -\frac{1}{2} \\ \frac{9}{2} \end{cases}$$

$$\begin{cases} x\geq 4 \\ x<-\frac{1}{2} \ \vee \ x>\frac{9}{2} \end{cases}$$



$$\boxed{x>\frac{9}{2}}$$