EQUAZIONI E DISEQUAZIONI IRRAZIONALI

EQUAZIONI

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

• n pari

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

$$\begin{cases} A(x) \geq 0 \\ B(x) \geq 0 \\ A(x) = [B(x)]^n \end{cases}$$

• n dispari

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

$$\Updownarrow$$

$$A(x) = [B(x)]^n$$

DISEQUAZIONI

$$\sqrt[n]{A(x)} > B(x) \quad \text{oppure} \quad \sqrt[n]{A(x)} < B(x)$$

• n pari

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

$$\Updownarrow$$

$$\begin{cases} A(x) \geq 0 \\ B(x) < 0 \end{cases} \cup \begin{cases} B(x) \geq 0 \\ A(x) > [B(x)]^n \end{cases}$$

• n dispari

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

$$\Updownarrow$$

$$A(x) > [B(x)]^n$$

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

$$\Updownarrow$$

$$\begin{cases} A(x) \geq 0 \\ B(x) > 0 \\ A(x) < [B(x)]^n \end{cases}$$

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

$$\Updownarrow$$

$$A(x) < [B(x)]^n$$

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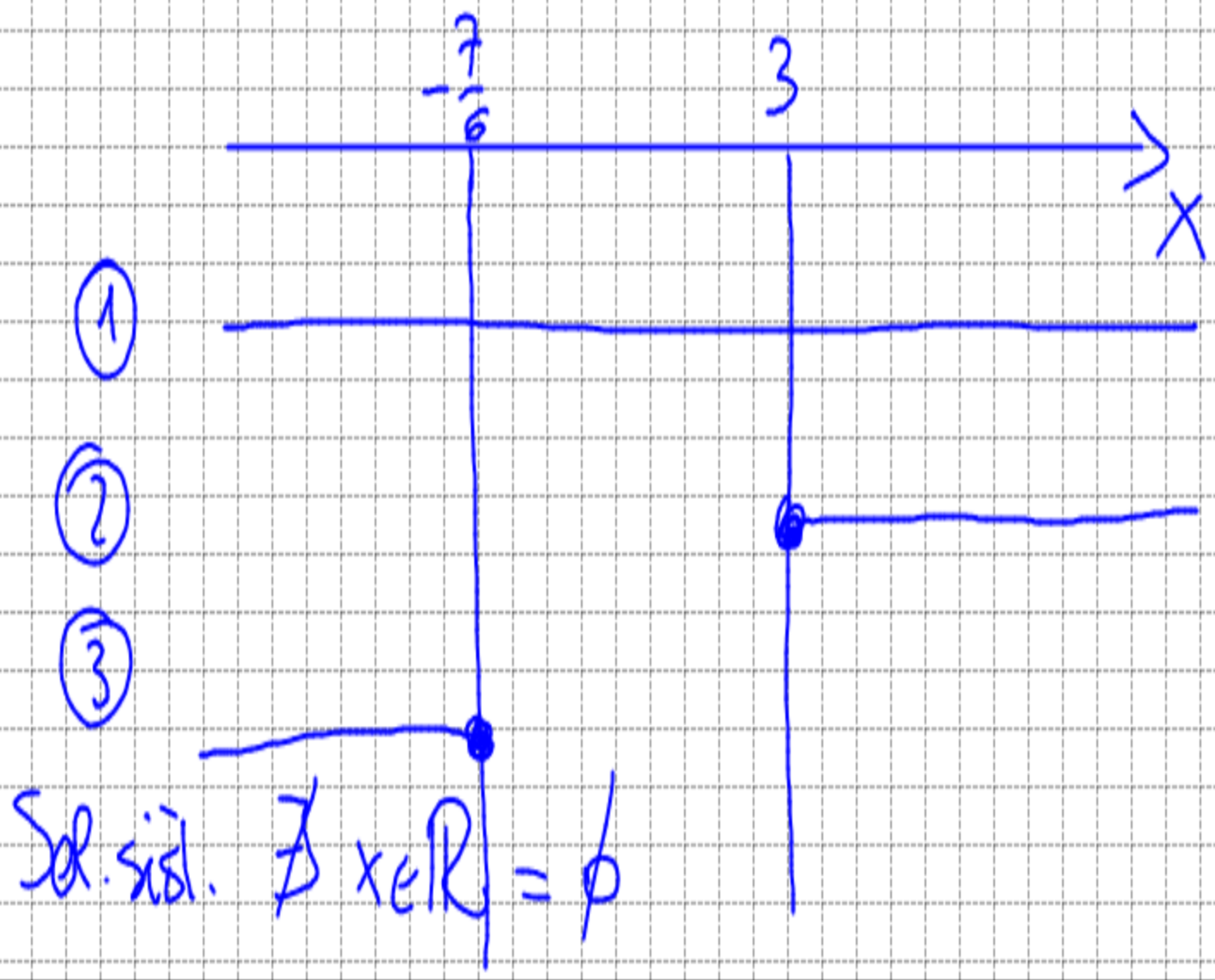
$$\sqrt{16+x^2}-x \leq -3$$

$$\sqrt{16+x^2} \leq x-3$$

$$\begin{cases} 16+x^2 \geq 0 \\ x-3 \geq 0 \\ 16+x^2 \leq (x-3)^2 \end{cases} \Rightarrow \begin{cases} \forall x \in \mathbb{R} \\ x \geq 3 \\ 16+\cancel{x^2} \leq \cancel{x^2}+9-6x \end{cases}$$

$$\begin{cases} \forall x \in \mathbb{R} \\ x \geq 3 \\ 6x \leq -7 \end{cases} \quad \begin{cases} \textcircled{1} \ \forall x \in \mathbb{R} \\ \textcircled{2} \ x \geq 3 \\ \textcircled{3} \ x \leq -\frac{7}{6} \end{cases}$$

$$\sqrt{A(x)} \leq B(x) \iff \begin{cases} A(x) \geq 0 \\ B(x) \geq 0 \\ A(x) \leq [B(x)]^n \end{cases}$$



Sol. sist. $\nexists \ x \in \mathbb{R} = \emptyset$

ESERCIZIO

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

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

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

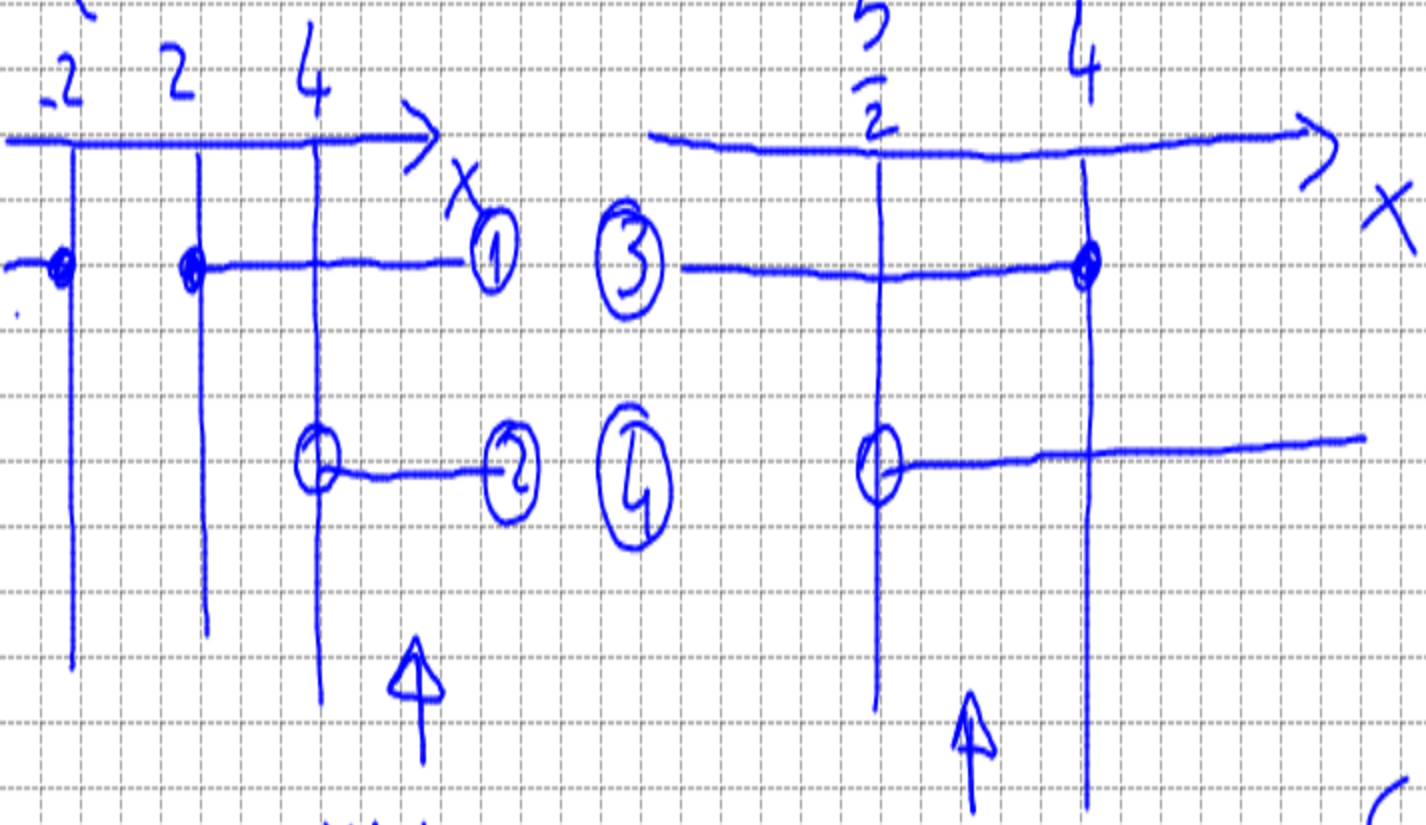
$$\begin{cases} B(x) < 0 \\ A(x) \geq 0 \end{cases} \cup \begin{cases} B(x) \geq 0 \\ A(x) > [B(x)]^2 \end{cases}$$

① $x \leq -2 \cup x \geq 2$

② $x > 4$

③ $x < 4$

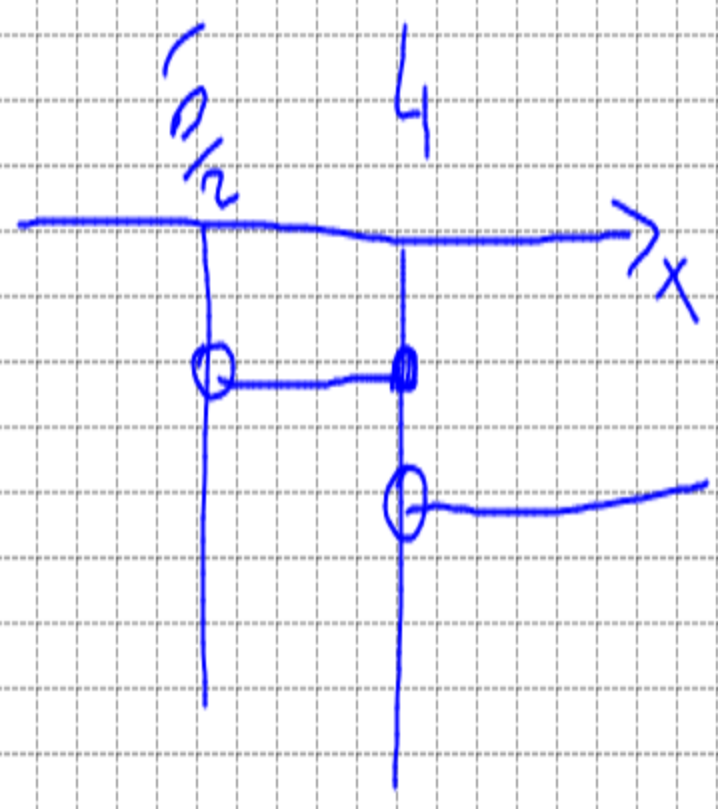
④ $x^2 - 4 > 16 + x^2 - 8x \Rightarrow 8x > 20 \quad x > \frac{5}{2}$



$x > 4$

$\cup$

$\frac{5}{2} < x \leq 4$



Sol: $x > \frac{5}{2}$