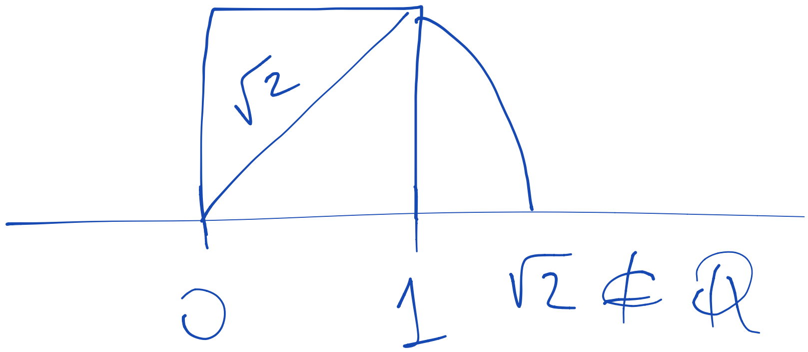
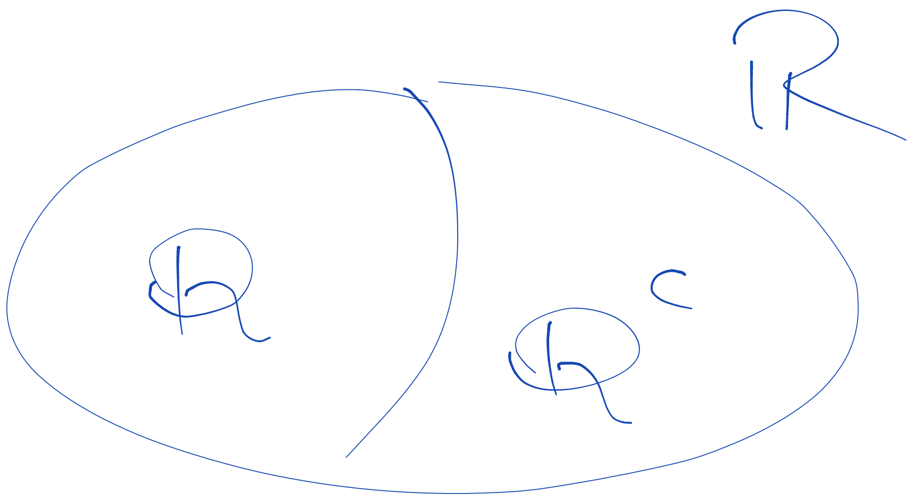
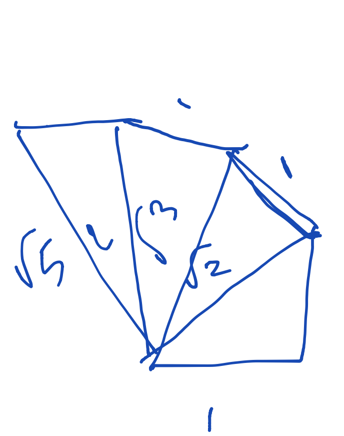
Numeri reali



$\sqrt{2} \notin \mathbb{Q}$





Radici quadrate

$$(+3)^2 = +9$$

$$(-3)^2 = +9$$

$$\sqrt{\underbrace{9}_{a}} = \underbrace{\pm 3}_{b}$$

Def. Diremo che il numero reale $b \geq 0$ è radice quadrata del numero reale $a \geq 0$ se

$$b^2 = a$$

Radici cubiche

Def: Un numero reale b è radice cubica del numero reale a se

$$b^3 = a$$

Radici n-me

$$\sqrt[n]{a^m}$$

indice

radicando

radice

Def: La radice n-ma del numero reale a :

- se n è pari, la radice esiste se $a \geq 0$ ed è il numero $b \geq 0$ tale che $b^n = a$
- se n è dispari, la radice esiste per ogni valore di $a \in \mathbb{R}$ ed è il numero $b \in \mathbb{R}$ tale che $b^n = a$

Condizioni di esistenza

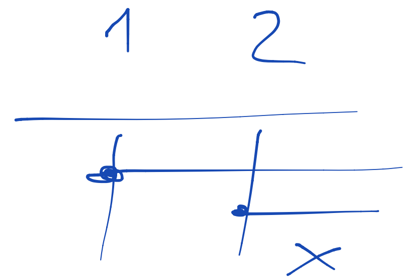
$\sqrt{-25} \notin \mathbb{R}$

1) $\sqrt{x-1}$ C.E. $x-1 \geq 0$; $x \geq 1$

2) $\sqrt{3x-2}$ C.E. $x \geq 2/3$

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

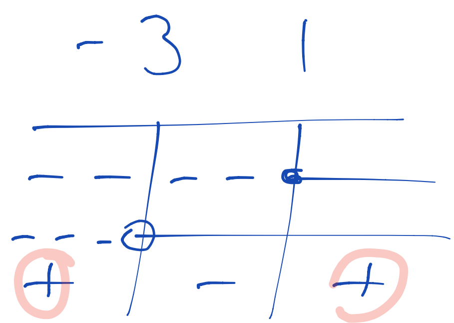
$$\begin{cases} x-1 \geq 0 \\ x-2 \geq 0 \end{cases} \qquad \begin{cases} x \geq 1 \\ x \geq 2 \end{cases}$$



$C.E. = [2; +\infty)$

4) $\sqrt{\dfrac{x-1}{x+3}}$

$$\frac{x-1}{x+3} \geq 0$$



$N \geq 0 \qquad x \geq 1$

$D > 0 \qquad x > -3$

$C.E. = (-\infty; -3) \cup [1; +\infty)$

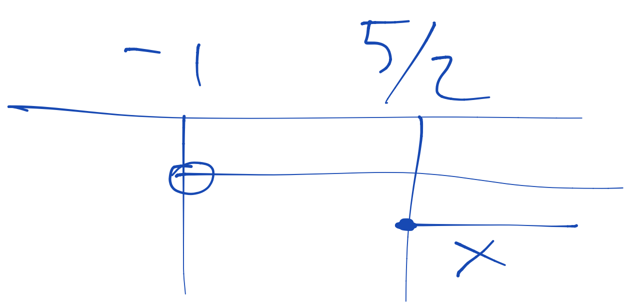
5) $\dfrac{1}{\sqrt{3x+1}}$

$$\begin{cases} 3x+1 \geq 0 \\ 3x+1 \neq 0 \end{cases} \Longrightarrow 3x+1 > 0$$

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

6) $\dfrac{1}{\sqrt{x+1}} + \sqrt{2x-5}$

$$\begin{cases} x+1 > 0 \\ 2x-5 \geq 0 \end{cases} \qquad \begin{cases} x > -1 \\ x \geq 5/2 \end{cases}$$



$$S = \left[5/2 ; +\infty\right)$$

7) $\sqrt{x+1} + \sqrt[3]{x-2}$

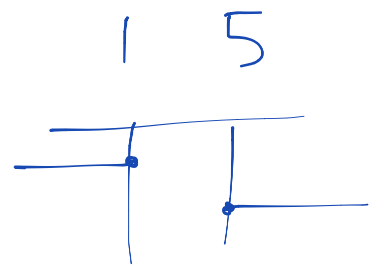
$x \geq -1$

8) $\sqrt{x+1} + \sqrt[4]{x-2}$

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

9) $\sqrt{1-x} + \sqrt{x-5}$

$$\begin{cases} 1-x \geq 0 \\ x-5 \geq 0 \end{cases} \qquad \begin{cases} x \leq 1 \\ x \geq 5 \end{cases}$$



C.E. $= \varnothing$

10) $\sqrt{x-1}+\sqrt{1-x}$

$$\begin{cases} x-1\geq 0 \\ 1-x\geq 0 \end{cases} \qquad \begin{cases} x\geq 1 \\ x\leq 1 \end{cases}$$

$$C.E. = \{1\}$$

Proprietà invariantiva

$$\frac{n\cdot \cancel{m}}{p\cdot \cancel{m}} = \frac{n}{p}$$

$$\sqrt{3} = \sqrt[6]{3^3} = \sqrt[12]{3^6} = \sqrt[4]{3^2}$$

$$\sqrt[9]{5^{12}} = \sqrt[3]{5^4}$$