Es 192 pag 800 (Portare fuori)

$$\sqrt[3]{x^6-x^3} = \sqrt[3]{x^3(x^3-1)} = x\sqrt[3]{x^3-1}$$

193: $\sqrt{x^3-4x^2} = \sqrt{x^2(x-4)} \boxed{=} |x|\sqrt{x-4}$ $\quad x \neq 0$

$\boxed{=} x\sqrt{x-4}$

Dovuto alle condizioni di esistenza

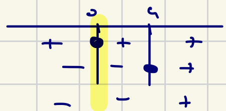
Se invece $x=0$ $\sqrt{x^3-4x^2}=0$

C.E.: $x^3-4x^2 \geq 0$

$x^2(x-4) \geq 0$

$f_1 \geq 0 \quad x^2 \geq 0 \quad \forall x \in \mathbb{R}$

$f_2 \geq 0 \quad x-4 \geq 0 \quad x \geq 4$



$\leadsto$ $\boxed{x \geq 4 \quad \vee \quad x=0}$

199: $\sqrt{x^3+10x^2+25x} =$

$\sqrt{x(x+5)^2} \boxed{=} |x+5|\sqrt{x} \boxed{=} (x+5)\sqrt{x}$

per le C.E. $(x+5) \geq 0$

Se $x \neq -5$

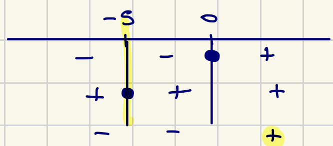
Se invece $x=-5$ $\leadsto$ il radicale è 0

C.E. $x^3+10x^2+25x \geq 0$

$x(x+5)^2 \geq 0$

$f_1: \quad x \geq 0$

$f_2: \quad (x+5)^2 \geq 0 \quad \forall x \in \mathbb{R}$



$\leadsto$ $\boxed{x \geq 0 \quad \vee \quad x=-5}$

201: $\sqrt{\dfrac{x^3-6x^2+9x}{(x+3)}} =$

$\sqrt{\dfrac{x(x-3)^2}{(x+3)}} = |x-3|\sqrt{\dfrac{x}{x+3}}$

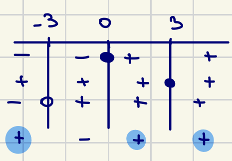
C.E. $\dfrac{x^3-6x^2+9x}{x+3} \geq 0 \qquad \dfrac{x(x^2-6x+9)}{x+3} \geq 0$

$\dfrac{x(x-3)^2}{x+3} \geq 0$

$N_1: \quad x \geq 0$

$N_2: \quad (x-3)^2 \geq 0 \quad \forall x \in \mathbb{R}$

$D: \quad x > -3$



$\boxed{x < -3 \quad \vee \quad x \geq 0}$

Pag 796 (Porto dentro)

125 $\frac{1}{x-1}\sqrt{\frac{x^3-x}{x^5}}$

C.E. : $\begin{cases} \frac{x^3-x}{x^5} \geq 0 \\ x-1 \neq 0 \end{cases}$

$\frac{x(x-1)(x+1)}{x^5} \geq 0$

N_1 : $x \geq 0$

N_2 : $x \geq -1$

N_3 : $x \geq 1$

D : $x^5 > 0 \leadsto x > 0$

	-1		0		1	
$-$		$-$	•	$+$		$+$
$-$	•	$+$		$+$		$+$
$-$		$-$		$-$	•	$+$
$-$		$-$	o	$+$		$+$
$+$		$-$		$-$		$+$

$\begin{cases} \boxed{x \leq -1 \quad \vee \quad x \geq 1} \\ x \neq 1 \end{cases} \leadsto \boxed{x \leq -1 \ \vee \ x > 1}$

Oss: Per portare dentro, deve essere positivo.

Caso 1: $\frac{1}{x-1} > 0$ cioè $x > 1$

Lo porto dentro

$\sqrt{\frac{1}{(x-1)^{\cancel{2}}} \cdot \frac{\cancel{x}(\cancel{x-1})(x+1)}{x^{\cancel{5}4}}}$

$= \sqrt{\frac{x+1}{x^4(x-1)}}$

Caso 2: $\frac{1}{x-1} < 0$ cioè quando $x < 1$. In questo caso

$\frac{1}{x-1}\sqrt{\frac{x^3-x}{x^5}} = -\frac{1}{1-x}\sqrt{\frac{x^3-x}{x^5}} = -\sqrt{\frac{1}{(1-x)^2}\cdot\frac{\cancel{x}(x-1)(x+1)}{x^{\cancel{5}4}}}$

Lo lui è positivo e lo porto dentro

$= -\sqrt{\frac{x+1}{x^4(x-1)}}$

$\frac{(x-1)}{(1-x)^2} = \frac{(x-1)}{(1-x)(1-x)}$

$= \frac{\cancel{x-1}}{-(\cancel{x-1})(1-x)} =$

$= \frac{1}{-(1-x)} = \frac{1}{x-1}$

126: $\frac{1-\sqrt{2}}{a}\sqrt[6]{\frac{a^4}{(\sqrt{2}-1)^5}}$

C.E. $\begin{cases} \frac{a^4}{(\sqrt{2}-1)^5} \geq 0 \\ a \neq 0 \end{cases}$ $\begin{cases} \forall a \in \mathbb{R} \\ a \neq 0 \end{cases}$

$\leadsto \boxed{a \neq 0}$

<u>Caso 1</u>: $\boxed{\frac{1-\sqrt{2}}{a} \geq 0 \rightsquigarrow a<0}$

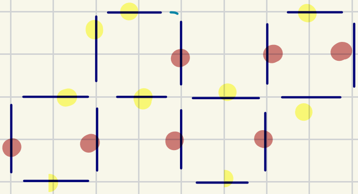
$N_1: \ a^4 \geq 0 \quad \forall a \in \mathbb{R}$
$N_2: \ (\sqrt{2}-1)^5 \geq 0 \quad \forall a \in \mathbb{R}$

$$\sqrt[6]{\frac{(1-\sqrt{2})^6}{a^{\cancel{6}\,2}} \cdot \frac{\cancel{a^4}}{(\sqrt{2}-1)^5}} = \sqrt[6]{\frac{\sqrt{2}-1}{a^2}}$$

<u>Caso 2</u>: $\boxed{\frac{1-\sqrt{2}}{a} \leq 0 \rightsquigarrow a>0}$

$$-\frac{\sqrt{2}-1}{a}\sqrt{\frac{a^4}{(\sqrt{2}-1)^5}} = -\sqrt{\frac{(\sqrt{2}-1)^{\cancel{6}}}{a^{\cancel{6}\,2}} \frac{\cancel{a^4}}{\cancel{(\sqrt{2}-1)^5}}} = -\sqrt{\frac{\sqrt{2}-1}{a^2}}$$

2 stecchini
$\rightsquigarrow$ esattamente 4 quadrati uguali



(1) Faccio □ delle stesse dim iniziale

(2) 4 stecchini a □ se voglio 4 quadrati ne servono $\leq 4 \cdot 4 = 16$

(3) Ho 16 stecchini $\Rightarrow$ i lati dei □ NON sono in comune

(4) Tutto inscritto in un 2×4