TROVARE IL DOMINIO

6/10/2021

118 $y = \dfrac{1}{\sqrt{|x|}} + \sqrt{x^3+1}$ $\quad [x \geq -1 \wedge x \neq 0]$

$$\begin{cases} |x| > 0 \\ x^3+1 \geq 0 \end{cases} \quad \begin{cases} x \neq 0 \\ x^3 \geq -1 \end{cases} \quad \begin{cases} x \neq 0 \\ x \geq -1 \end{cases} \quad x \neq 0 \wedge x \geq -1$$

RADICE CUBICA

$$D = [-1, 0) \cup (0, +\infty)$$

137 $y = \dfrac{\sqrt{16-x^2}}{x^2-6x+9}$ $\quad [-4 \leq x < 3 \vee 3 < x \leq 4]$

$$\begin{cases} 16 - x^2 \geq 0 \\ x^2 - 6x + 9 \neq 0 \end{cases} \quad \begin{cases} x^2 \leq 16 \\ (x-3)^2 \neq 0 \end{cases} \quad \begin{cases} -4 \leq x \leq 4 \\ x \neq 3 \end{cases}$$

$$-4 \leq x \leq 4 \wedge x \neq 3$$

$$D = [-4, 3) \cup (3, 4]$$

138 $y = \dfrac{\sqrt{4x-6}}{\sqrt[3]{x^3-8x^2}}$ $\quad \left[\dfrac{3}{2} \leq x < 8 \vee x > 8\right]$

$$\begin{cases} 4x - 6 \geq 0 \\ x^3 - 8x^2 \neq 0 \end{cases} \quad \begin{cases} x \geq \frac{3}{2} \\ x^2(x-8) \neq 0 \end{cases} \quad \begin{cases} x \geq \frac{3}{2} \\ x \neq 0 \wedge x \neq 8 \end{cases}$$

$$D = \left[\frac{3}{2}, 8\right) \cup (8, +\infty)$$

139 $y = \dfrac{1}{|x^2-4|-3}$ $[x \neq \pm 1 \wedge x \neq \pm\sqrt{7}]$

$x \neq -1 \wedge x \neq 1 \wedge x \neq -\sqrt{7} \wedge x \neq \sqrt{7}$

$|x^2-4|-3 \neq 0$

$|x^2-4| \neq 3$ $\begin{cases} x^2-4 \neq 3 \\ x^2-4 \neq -3 \end{cases}$ $\begin{cases} x^2 \neq 7 \\ x^2 \neq 1 \end{cases}$ $\begin{cases} x \neq -\sqrt{7} \wedge x \neq \sqrt{7} \\ x \neq -1 \wedge x \neq 1 \end{cases}$

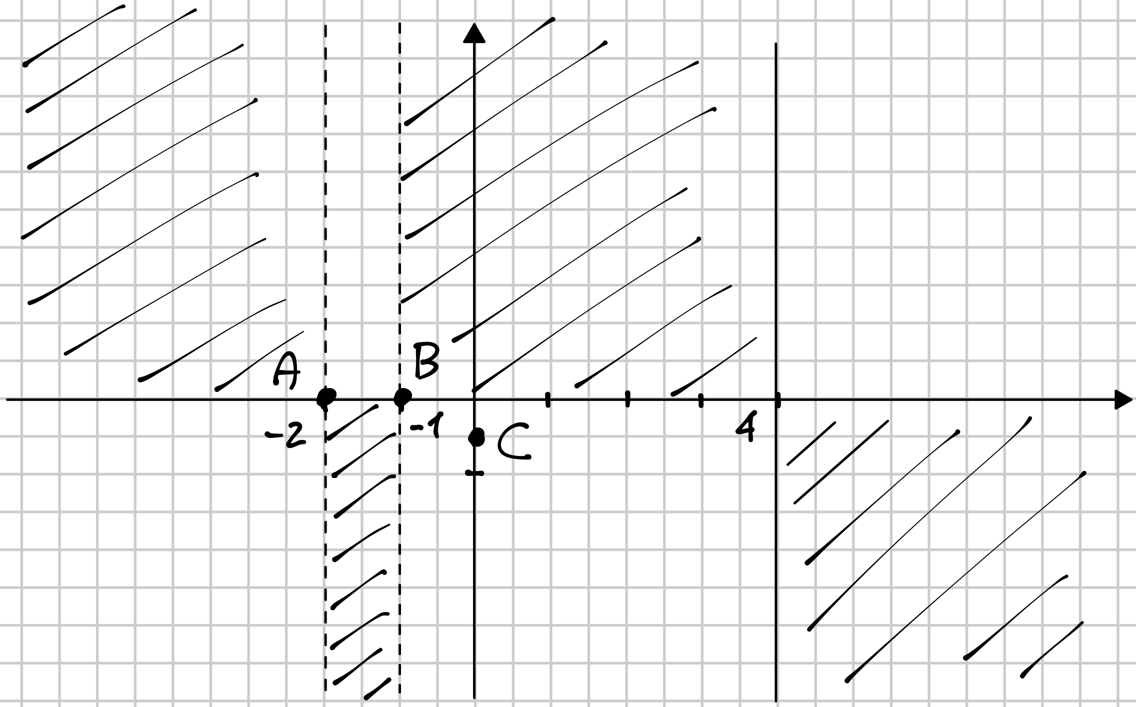
$D = \mathbb{R} \setminus \{-1, 1, -\sqrt{7}, \sqrt{7}\} =$

$= (-\infty, -\sqrt{7}) \cup (-\sqrt{7}, -1) \cup (-1, 1) \cup (1, \sqrt{7}) \cup (\sqrt{7}, +\infty)$

192 $y = \dfrac{(x+2)(x+1)}{x-4}$

STUDIO DI FUNZIONE

1) DOMINIO $\quad x - 4 \neq 0 \Rightarrow x \neq 4 \qquad D = (-\infty, 4) \cup (4, +\infty)$



2) INTERSEZ. CON GLI ASSI

ZERI (int. asse x)

$$\begin{cases} y = \dfrac{(x+2)(x+1)}{x-4} \\ y = 0 \end{cases} \Rightarrow \dfrac{(x+2)(x+1)}{\cancel{x-4}} = 0 \Rightarrow x = -2 \lor x = -1$$

$A(-2, 0) \qquad B(-1, 0)$

-2 e -1 sono ZERI della funzione

INT. ASSE y

$$\begin{cases} y = \dfrac{(x+2)(x+1)}{x-4} = \dfrac{2 \cdot 1}{-4} = -\dfrac{1}{2} \\ x = 0 \end{cases}$$

$C\left(0, -\dfrac{1}{2}\right)$

3) STUDIO DEL SEGNO

$$y = \frac{(x+2)(x+1)}{x-4} > 0 \qquad \text{devo risolvere} \qquad \frac{\overset{①}{(x+2)}\overset{②}{(x+1)}}{\underset{③}{x-4}} > 0$$

① $x+2>0 \implies x>-2$

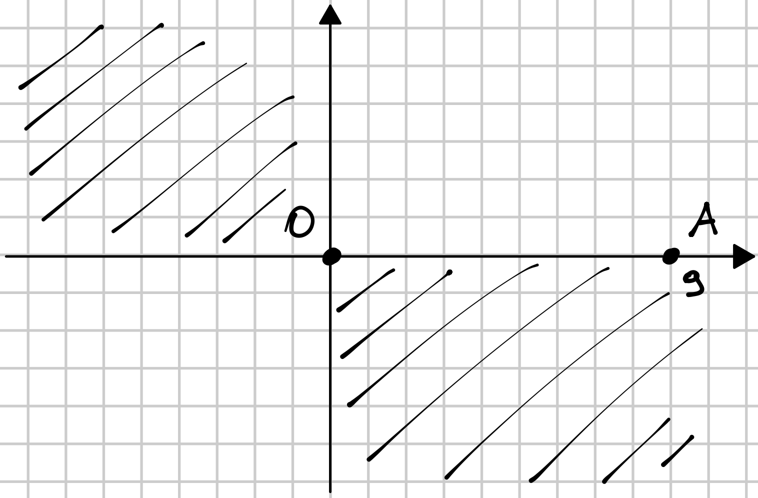
② $x+1>0 \implies x>-1$

③ $x-4>0 \implies x>4$

		-2		-1		4	
①	$-$	0	$+$		$+$		$+$
②	$-$		$-$	0	$+$		$+$
③	$-$		$-$		$-$	$\nexists$	$+$
	$-$	0	$+$	0	$-$	$\nexists$	$+$

193 $y = 3x|x^2 - 9x|$

1) DOMINIO $\quad D = \mathbb{R} = (-\infty, +\infty)$



2) INT. ASSI

$$\begin{cases} y = 3x|x^2 - 9x| \\ y = 0 \quad (\text{asse } x) \end{cases} \Rightarrow \quad 3x|x^2 - 9x| = 0 \;\begin{cases} \nearrow x = 0 \\ \searrow |x^2 - 9x| = 0 \end{cases}$$

$$\Downarrow$$

$$|x(x-9)| = 0 \qquad x = 0 \qquad x = 9$$

$O(0,0) \quad A(9,0)$

↑ è anche l'unica intersez. con l'asse y

3) SEGNO

$$\underbrace{3x}_{①}\underbrace{|x^2 - 9x|}_{②} > 0$$

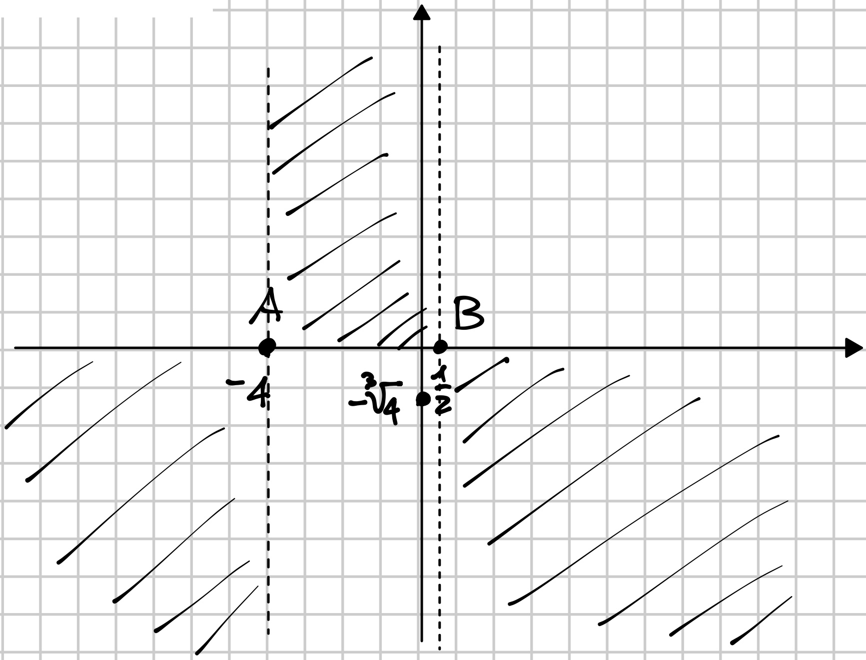
$3x > 0 \quad x > 0$

$|x^2 - 9x| > 0 \Rightarrow x \neq 0 \wedge x \neq 9$

		0		9	
①	$-$	0	$+$		$+$
②	$+$	0	$+$	0	$+$
	$-$	0	$+$	0	$+$

198 $y = \sqrt[3]{2x^2 + 7x - 4}$

1) $D = \mathbb{R} = (-\infty, +\infty)$



2) INT. ASSI

$$\begin{cases} y = \sqrt[3]{2x^2+7x-4} \\ y = 0 \end{cases} \Rightarrow \sqrt[3]{2x^2+7x-4} = 0 \Rightarrow 2x^2+7x-4=0$$

$$\Delta = 49 + 32 = 81$$

$$x = \frac{-7 \pm 9}{4} = \begin{cases} -4 \\ \frac{1}{2} \end{cases}$$

$A(-4, 0)$ $B\left(\frac{1}{2}, 0\right)$

$$\begin{cases} y = \sqrt[3]{2x^2+7x-4} \\ x = 0 \end{cases} \Rightarrow \begin{cases} y = \sqrt[3]{-4} = -\sqrt[3]{4} \\ x = 0 \end{cases}$$

$C\left(0, -\sqrt[3]{4}\right)$

3) SEGNO

$$\sqrt[3]{2x^2+7x-4} > 0 \Rightarrow 2x^2+7x-4 > 0$$

$x < -4 \ \vee \ x > \frac{1}{2}$

$$\begin{array}{ccccc} & -4 & & \frac{1}{2} & \\ + & \phi & - & \phi & + \end{array}$$