

26/3/2021

497
$$\begin{cases} \text{A} & -x^4 + 5x^2 - 4 > 0 \\ \text{B} & x < \frac{8}{x^2} \end{cases} \quad [-2 < x < -1 \vee 1 < x < 2]$$

A $-x^4 + 5x^2 - 4 > 0$

$$x^4 - 5x^2 + 4 < 0$$

$$(x^2 - 4)(x^2 - 1) < 0$$

$$\underbrace{(x-2)}_{N_1} \underbrace{(x+2)}_{N_2} \underbrace{(x-1)}_{N_3} \underbrace{(x+1)}_{N_4} < 0$$

$$x - 2 > 0 \quad x > 2$$

$$x + 2 > 0 \quad x > -2$$

$$x - 1 > 0 \quad x > 1$$

$$x + 1 > 0 \quad x > -1$$

	-2	-1	1	2	
	-	-	-	-	0 +
	-	0 +	+	+	+
	-	-	-	0 +	+
	-	-	0 +	+	+
	+	0 (-)	+	0 (-)	+

$$-2 < x < -1 \vee 1 < x < 2$$

ALTRA MODO

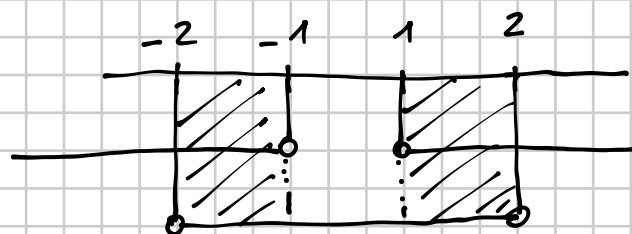
$$x^4 - 5x^2 + 4 < 0 \quad x^2 = t$$

$$t^2 - 5t + 4 < 0$$

$$1 < t < 4 \Rightarrow 1 < x^2 < 4$$

$$t_1 = 1 \quad t_2 = 4$$

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



$$-2 < x < -1 \vee 1 < x < 2$$

[B] $x < \frac{8}{x^2}$

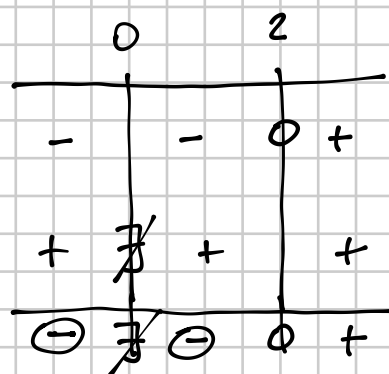
$$x - \frac{8}{x^2} < 0$$

[N] $\frac{x^3 - 8}{x^2} < 0$

[D] x^2

[N] $x^3 - 8 > 0 \quad x^3 > 8 \quad x > 2$

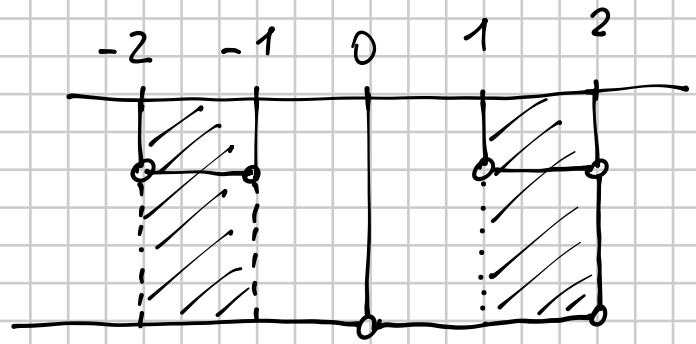
[D] $x^2 > 0 \quad \forall x \neq 0$



$$x < 0 \vee 0 < x < 2$$

(*oppure* $x < 2 \wedge x \neq 0$)

$$\begin{cases} -2 < x < -1 \quad \vee \quad 1 < x < 2 \\ x < 0 \quad \vee \quad 0 < x < 2 \end{cases}$$



$$-2 < x < -1 \quad \vee \quad 1 < x < 2$$

OSSERVAZIONE IMPORTANTE

$1 < x < 2$ significa

$$1 < x \quad \wedge \quad x < 2$$

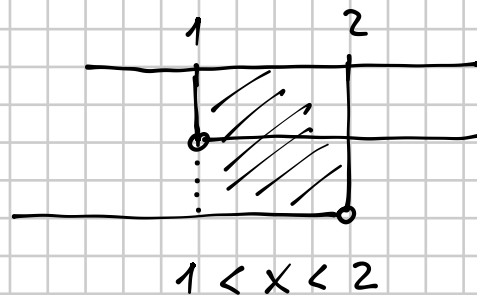
cioè

$$x > 1 \quad \wedge \quad x < 2$$

in modo equivalente $\begin{cases} x > 1 \\ x < 2 \end{cases} \leftarrow \text{intersezione}$

$$x > 1$$

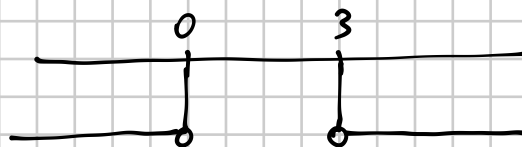
$$x < 2$$



$$1 < x < 2$$

$$x < 0 \quad \vee \quad x > 3$$

↑
unione di 2 intervalli



$$\text{INTERSEZIONE} = \cap \quad \wedge$$

$$\text{UNIONE} = \cup \quad \vee$$

501
$$\textcircled{A} \begin{cases} \frac{x^4 - 2x^3}{x^2 - 1} \geq 0 \end{cases}$$

$$\textcircled{B} \begin{cases} x^5 - 4x^3 - x^2 + 4 > 0 \end{cases}$$

$$[-2 < x < -1 \vee 0 \leq x < 1 \vee x > 2]$$

$$\textcircled{A} \frac{x^4 - 2x^3}{x^2 - 1} \geq 0 \quad \frac{\overset{N_1}{x^3}(\overset{N_2}{x-2})}{\underset{D_1}{x^2 - 1}} \geq 0$$

$N_1 > 0 \quad x^3 > 0 \quad x > 0$

$N_2 > 0 \quad x - 2 > 0 \quad x > 2$

$D_1 > 0 \quad x^2 - 1 > 0 \quad x < -1 \vee x > 1$

$x < -1 \vee 0 \leq x < 1 \vee x \geq 2$

	-1	0	1	2
N_1	-	- 0 +	+	+
N_2	-	-	-	- 0 +
D_1	+ /	-	- /	+ /
Sign	+	-	+	-
Result	+	0	+	0

$$\textcircled{B} x^5 - 4x^3 - x^2 + 4 > 0$$

$$x^3(x^2 - 4) - (x^2 - 4) > 0$$

$$\underset{N_1}{(x^2 - 4)} \underset{N_2}{(x^3 - 1)} > 0$$

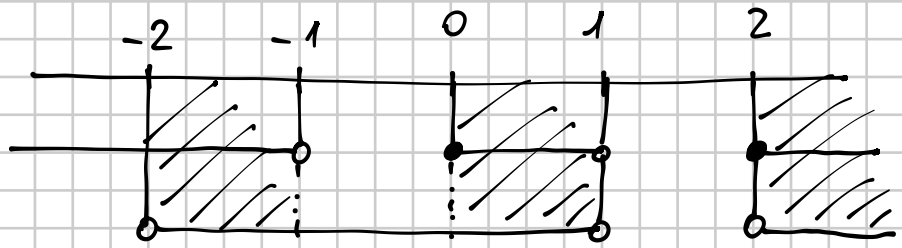
$N_1 > 0 \quad x^2 - 4 > 0 \quad x < -2 \vee x > 2$

$N_2 > 0 \quad x^3 - 1 > 0 \quad x^3 > 1 \quad x > 1$

$-2 < x < 1 \vee x > 2$

	-2	1	2
N_1	+ 0 -	-	- 0 +
N_2	-	- 0 +	+
Sign	-	0	-
Result	-	0	-

$$\begin{cases} x < -1 \vee 0 \leq x < 1 \vee x \geq 2 \\ -2 < x < 1 \vee x > 2 \end{cases}$$



$$-2 < x < -1 \vee 0 \leq x < 1 \vee x > 2$$

500 $\begin{cases} x^3 - 3x + 2 > 0 \\ x^6 - 3x^3 + 2 > 0 \end{cases}$

$$[-2 < x < 1 \vee x > \sqrt[3]{2}]$$

A $x^3 - 3x + 2 > 0$

$$\begin{array}{c|ccc|c} & 1 & 0 & -3 & 2 \\ 1 & & 1 & 1 & -2 \\ \hline & 1 & 1 & -2 & // \end{array}$$

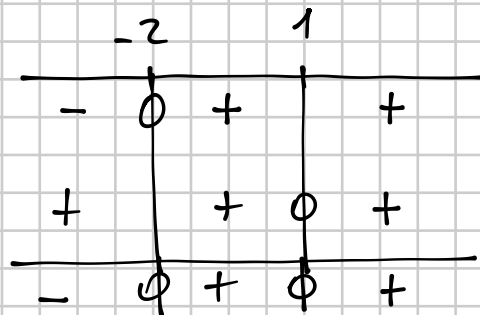
$$(x^2 + x - 2)(x - 1) > 0$$

$$(x + 2)(x - 1)(x - 1) > 0$$

$$\underbrace{(x + 2)}_{N_1} \underbrace{(x - 1)^2}_{N_2} > 0$$

$$N_1 > 0 \quad x + 2 > 0 \quad x > -2$$

$$N_2 > 0 \quad (x - 1)^2 > 0 \quad \forall x \neq 1$$



$$-2 < x < 1 \vee x > 1$$

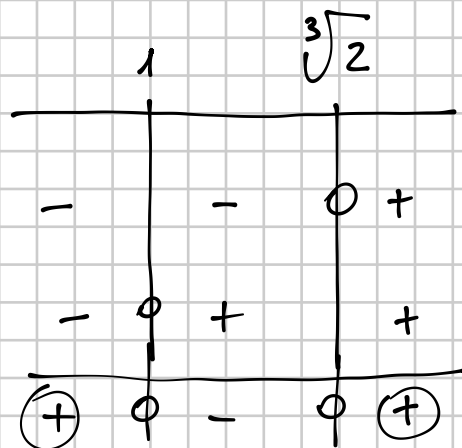
$$(x > -2 \wedge x \neq 1)$$

$$B) x^6 - 3x^3 + 2 > 0$$

$$(x^3 - 2)^{N_1} (x^3 - 1)^{N_2} > 0$$

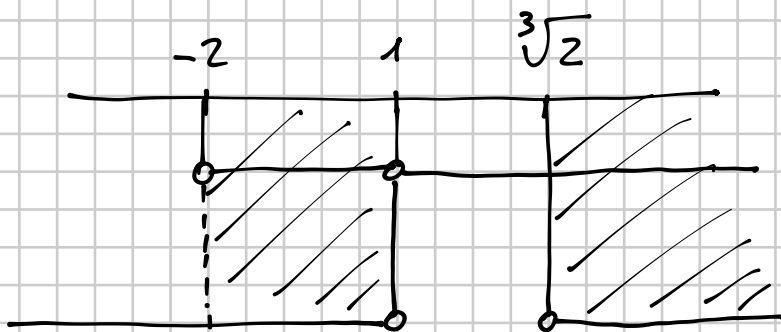
$$N_1 \quad x^3 - 2 > 0 \quad x^3 > 2 \quad x > \sqrt[3]{2}$$

$$N_2 \quad x^3 - 1 > 0 \quad x^3 > 1 \quad x > 1$$



$$x < 1 \vee x > \sqrt[3]{2}$$

$$\begin{cases} -2 < x < 1 \vee x > 1 \\ x < 1 \vee x > \sqrt[3]{2} \end{cases}$$



$$\boxed{-2 < x < 1 \vee x > \sqrt[3]{2}}$$