11/12/2020

167

$$\begin{cases} \textcircled{1}\ \dfrac{1}{x-1} \geq 1 \\ \textcircled{2}\ \dfrac{x-1}{3} > \dfrac{-2(x+1)}{5} \\ \textcircled{3}\ x - 1 \geq -3 \end{cases} \qquad [1 < x \leq 2]$$

① $\dfrac{1}{x-1} \geqslant 1 \qquad \dfrac{1}{x-1} - 1 \geqslant 0 \qquad \dfrac{1-x+1}{x-1} \geqslant 0$

$\dfrac{2-x}{x-1} \geqslant 0$ (N / D)

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

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

		1		2	
N	+		+	0	−
D	−	∄	+		+
	−	∄	+	0	−

$1 < x \leq 2$

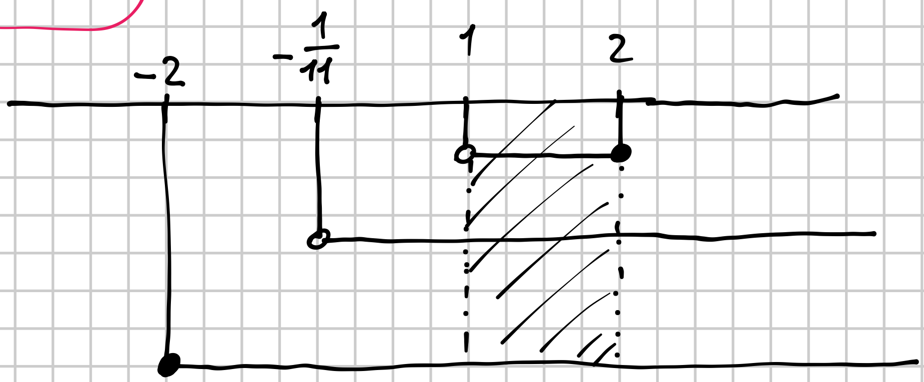
② $\dfrac{x-1}{3} > \dfrac{-2(x+1)}{5} \qquad \dfrac{5(x-1)}{\cancel{15}} > \dfrac{-6(x+1)}{\cancel{15}}$

$5x - 5 > -6x - 6 \qquad 5x + 6x > 5 - 6$

$11x > -1 \qquad x > -\dfrac{1}{11}$

③ $x - 1 \geqslant -3 \qquad x \geqslant -2$

$$\begin{cases} \textcircled{1}\ 1 < x \leq 2 \\ \textcircled{2}\ x > -\dfrac{1}{11} \\ \textcircled{3}\ x \geqslant -2 \end{cases}$$



$\boxed{1 < x \leq 2}$

$$\begin{cases} \frac{1}{x-1} > 2 & ① \\ (x-2)^2 \geq x^2 & ② \\ \frac{1}{x^2-4x+4} < 0 & ③ \end{cases}$$

169 [Impossibile]

① $\dfrac{1}{x-1} > 2 \qquad \dfrac{1}{x-1} - 2 > 0 \qquad \dfrac{1-2(x-1)}{x-1} > 0$

$\dfrac{1-2x+2}{x-1} > 0 \qquad \dfrac{3-2x}{x-1} > 0$ (N, D)

$N > 0 \quad 3-2x > 0 \quad -2x > -3 \quad 2x < 3 \quad x < \frac{3}{2}$

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

$$\boxed{1 < x < \frac{3}{2}}$$

	1		$\frac{3}{2}$	
+		+	0	−
−	∄	+		+
−	∄	+	0	−

② $\cancel{x^2} + 4 - 4x \geq \cancel{x^2} \qquad -4x \geq -4 \qquad 4x \leq 4 \qquad \boxed{x \leq 1}$

③ $\dfrac{1}{x^2-4x+4} < 0 \qquad \dfrac{1}{(x-2)^2} < 0$ IMPOSSIBILE

se anche la risolvo...

$\dfrac{1}{(x-2)(x-2)} < 0$ (N; D_1, D_2)

$N \quad 1 > 0 \quad \forall x$

$D_1 \quad x-2 > 0 \quad x > 2$

$D_2 \quad x-2 > 0 \quad x > 2$

	2	
+		+
−	∄	+
−	∄	+
+	∄	+

dato che non è mai − la diseq. è IMPOSSIBILE

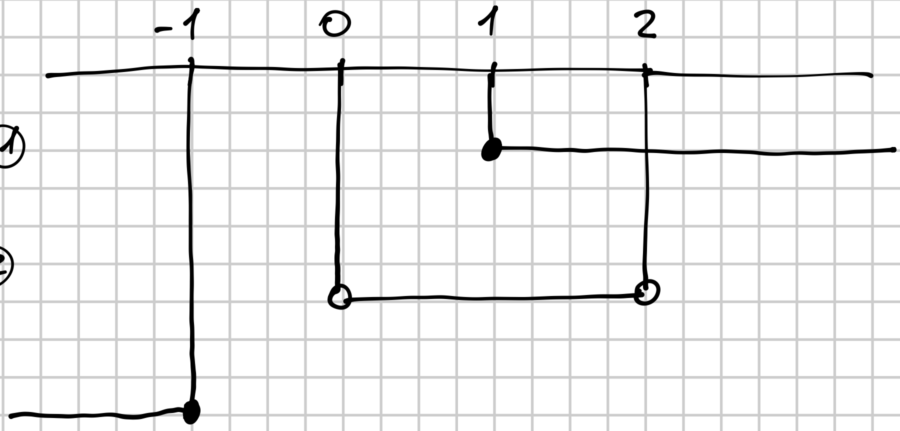
$$\begin{cases} 1 < x < \frac{3}{2} \\ x \leq 1 \\ \nexists x \end{cases}$$

anche questi due insiemi hanno come intersezione ∅ (non hanno elementi comuni)

SISTEMA IMPOSSIBILE

ESEMPIO

$$\begin{cases} x \geq 1 & (1) \\ 0 < x < 2 & (2) \\ x \leq -1 & (3) \end{cases}$$



Ci sono zone con 3 linee? NO, quindi l'intersezione è l'ins. vuoto $\emptyset$ e il sistema è IMPOSSIBILE

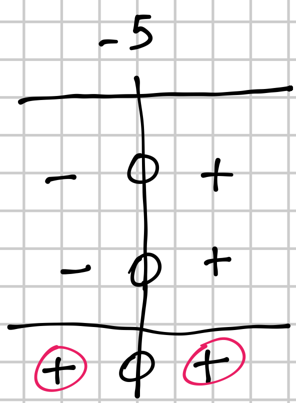
ALTRO ESEMPIO

- $x^2 + 10x + 25 > 0$

$$(x+5)^2 > 0 \Rightarrow \overset{N_1}{(x+5)}\overset{N_2}{(x+5)} > 0$$

$N_1 > 0 \quad x+5 > 0 \quad x > -5$

$N_2 > 0 \quad x+5 > 0 \quad x > -5$



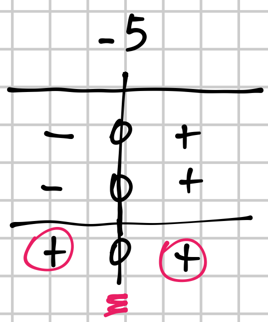
$x < -5 \vee x > 5$

$\Downarrow$

$\forall x \in \mathbb{R} - \{5\}$

- $x^2 + 10x + 25 \geq 0$

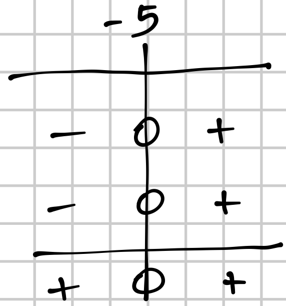
. . . . . .



$\forall x \in \mathbb{R}$

- $x^2 + 10x + 25 < 0$

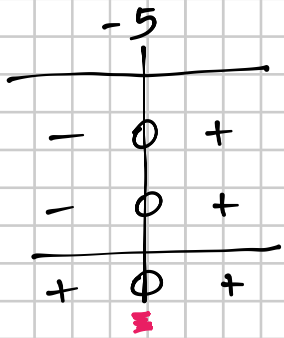
$(x+5)^2 < 0 \qquad (x-5)(x-5) < 0 \quad \ldots$



IMPOSSIBILE

- $x^2 + 10x + 25 \leq 0$

$(x+5)^2 \leq 0 \qquad (x-5)(x-5) \leq 0 \quad \ldots$



$\boxed{x = -5}$

144 $\dfrac{x^3(x^2+4)}{(x-1)^2} > 0$ $[x > 0 \wedge x \neq 1]$

METODO VELOCE

$$\frac{x^3(x^2+4)}{(x-1)^2} > 0$$

SEMPRE > 0 NON LO CONSIDERO perché non influisce sul segno della frazione

$$\Downarrow$$

$$\frac{x^3}{(x-1)^2} > 0 \qquad x \cdot \frac{x^2}{(x-1)^2} > 0$$

QUADRATO SEMPRE POSITIVO TRANNE IN 0

QUADRATO SEMPRE POSITIVO TRANNE IN 1

$$\Downarrow$$

$$\begin{cases} x > 0 \\ x \neq 1 \end{cases} \qquad \boxed{x > 0 \ \wedge \ x \neq 1}$$

COMPITO: rifarlo col metodo STANDARD