

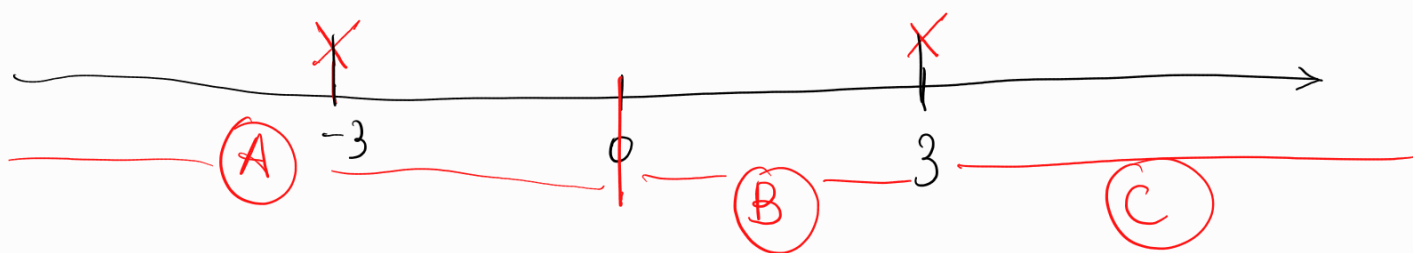
$$f(x) = \frac{|x^2 - 3x|}{3 - |x|} = \frac{|x| |x-3|}{3 - |x|}$$

Domínio $3 - |x| \neq 0 \Leftrightarrow |x| \neq 3 \Leftrightarrow x \neq \pm 3$

$$\text{Dom } f = (-\infty, -3) \cup (-3, +3) \cup (3, +\infty).$$

$$|x| = \begin{cases} x & \text{se } x \geq 0 \\ -x & \text{se } x < 0 \end{cases}$$

$$|x-3| = \begin{cases} x-3 & \text{se } x \geq 3 \\ 3-x & \text{se } x < 3 \end{cases}$$



(A) $x < 0 \Rightarrow |x| = -x$, $|x-3| = 3-x$

$$f(x) = \frac{|x| |x-3|}{3 - |x|} = \frac{(-x)(3-x)}{3+x} = \frac{x^2 - 3x}{3+x}$$

(B) $0 \leq x < 3 \Rightarrow |x| = x$, $|x-3| = 3-x$

$$f(x) = \frac{|x| |x-3|}{3 - |x|} = \frac{x(3-x)}{3-x} = x$$

(C) $x > 3 \Rightarrow |x| = x$, $|x-3| = x-3$

$$f(x) = \frac{|x| |x-3|}{3 - |x|} = \frac{x(x-3)}{3-x} = -x$$

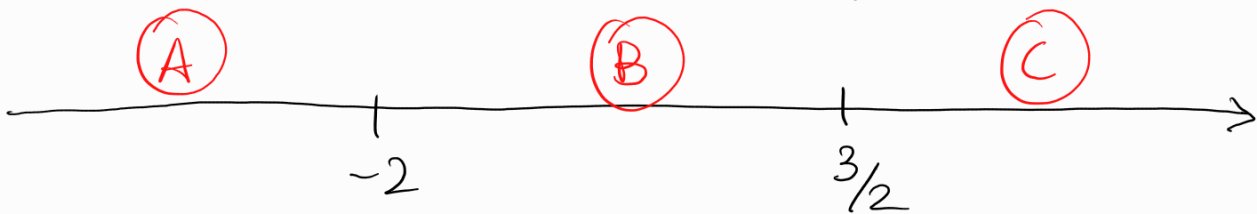
$$\Rightarrow f(x) = \begin{cases} \frac{x^2-3x}{3+x} & \text{se } x \in (-\infty, -3) \cup (-3, 0) \\ x & \text{se } x \in [0, 3) \\ -x & \text{se } x \in (3, +\infty) \end{cases}$$

Risolvere la diseq^{ne} $|x+2| \leq |2x-3| + 1$

1° modo "spezzando" i valori assoluti.

$$|x+2| = \begin{cases} x+2 & \text{se } x \geq -2 \\ -x-2 & \text{se } x < -2 \end{cases}$$

$$|2x-3| = \begin{cases} 2x-3 & \text{se } x \geq \frac{3}{2} \\ 3-2x & \text{se } x < \frac{3}{2} \end{cases}$$



$$\textcircled{A} \quad \begin{cases} x < -2 \\ -x-2 \leq 3-2x+1 \end{cases} \quad \begin{cases} x < -2 \\ x \leq 6 \end{cases} \quad \boxed{x < -2}$$

$$\textcircled{B} \quad \begin{cases} -2 \leq x < \frac{3}{2} \\ x+2 \leq 3-2x+1 \end{cases} \quad \begin{cases} -2 \leq x < \frac{3}{2} \\ \cancel{3x \leq 2} \\ x \leq \frac{2}{3} \end{cases} \quad \boxed{-2 \leq x \leq \frac{2}{3}}$$

$$\textcircled{C} \quad \begin{cases} x \geq \frac{3}{2} \\ x+2 \leq 2x-3+1 \end{cases} \quad \begin{cases} x \geq \frac{3}{2} \\ x \geq 4 \end{cases} \quad \boxed{x \geq 4}$$

Solⁿⁱ della diseq^{ne}: devo fare l'unione

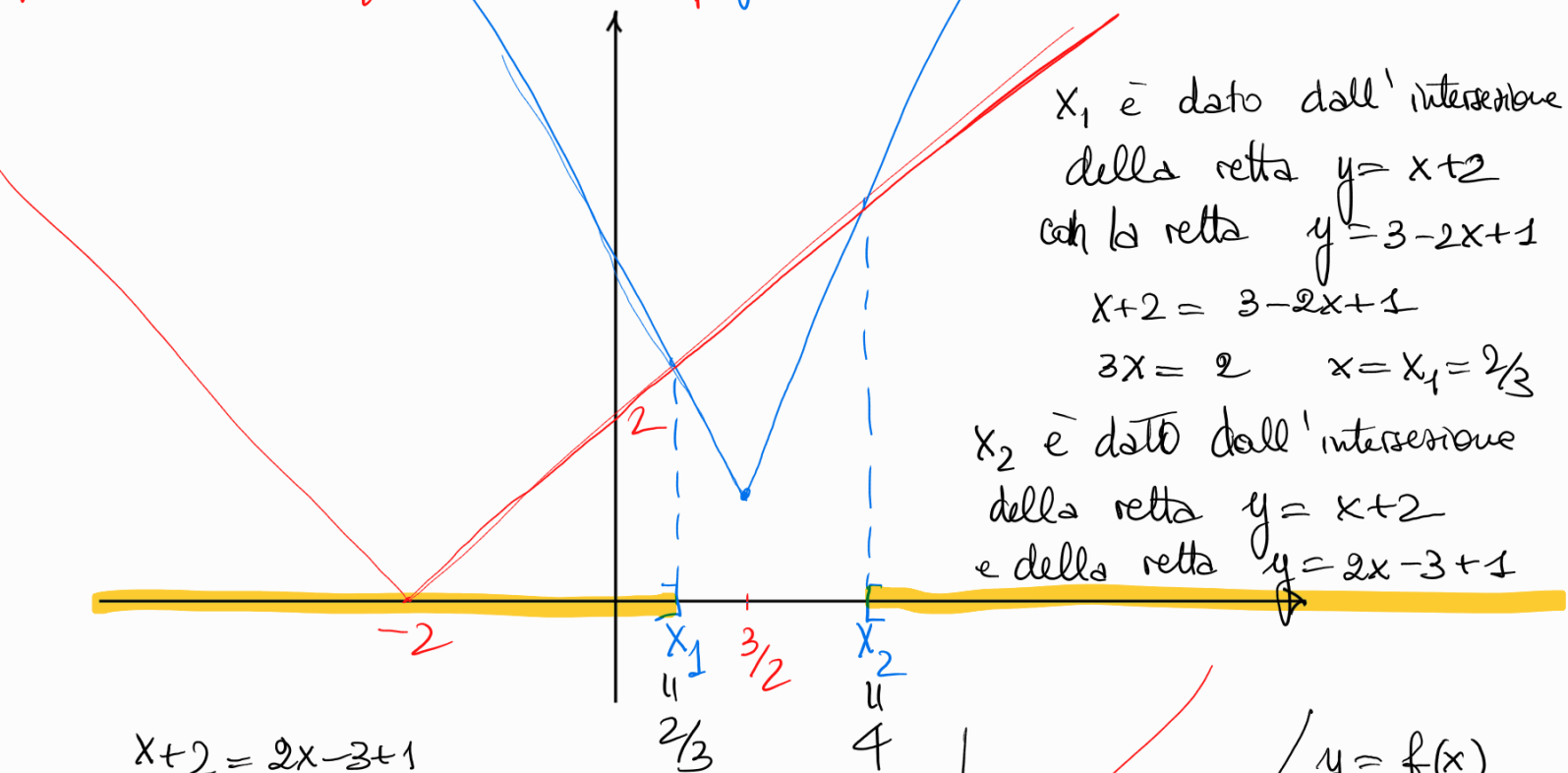
$$(x < -2) \vee (-2 \leq x \leq \frac{2}{3}) \vee (x \geq 4)$$

Sol^{mi}: $x \in (-\infty, \frac{2}{3}] \cup [4, +\infty)$

2° modo: risoluzione grafica

$$|x+2| \leq |2x-3| + 1$$

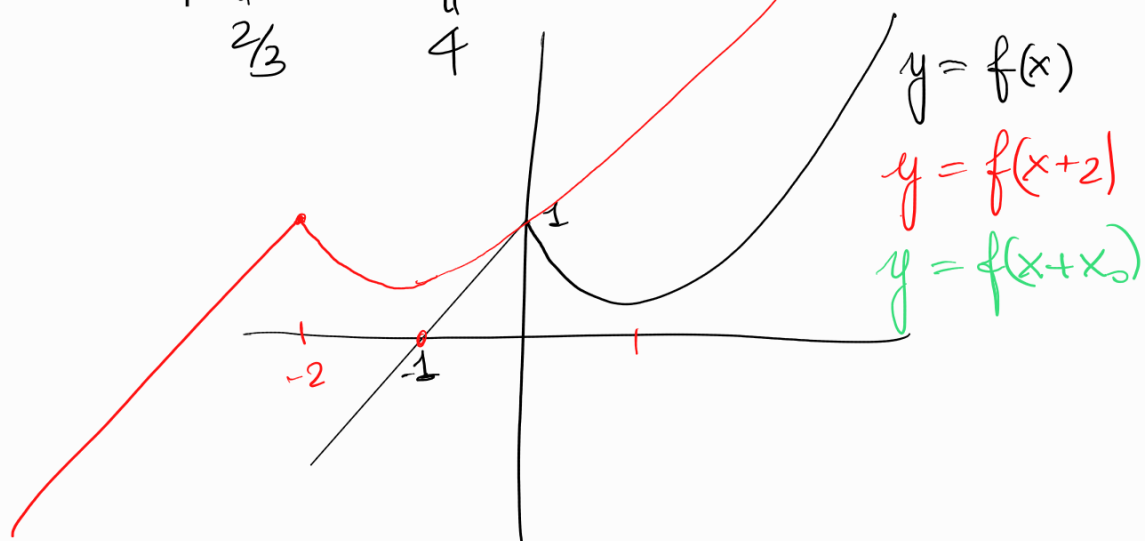
$$f(x) = |x+2| = \begin{cases} x+2 & \text{se } x \geq -2 \\ -x-2 & \text{se } x < -2 \end{cases} \quad | \quad g(x) = |2x-3| + 1$$



$$x+2 = 2x-3+1$$

$$x = x_2 = 4$$

$$f(x) =$$



Il grafico di $f(x+x_0)$ è ottenuto dal grafico di f spostandolo orizzontalmente di $\underline{\underline{-x_0}}$

$$g(x) = |2x-3| + 1$$

$$h(x) = |x|$$

$$k(x) = \left|x - \frac{3}{2}\right|$$

$$f(x) = 2k(x) = |2x-3|$$

