EQUAZIONI E DISEQUAZIONI FRATTE

$$\frac{f(x)}{g(x)} = 0 \qquad \text{EQUAZIONE FRATTA}$$

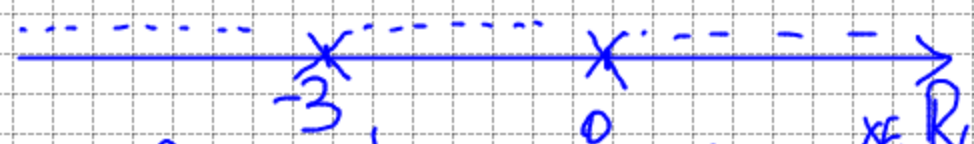
$$\frac{f(x)}{g(x)} > 0 \quad (<0) \qquad \text{DISEQUAZIONE FRATTE}$$

ESEMPIO

$$\frac{x^2-4}{x^2+3x} = 0$$

$$x^2 - 4 = 0$$

$$\boxed{x = \pm 2}$$



$$C.E. = \{x \in \mathbb{R} \mid x^2 + 3x \neq 0\} =$$

$$= \{x \in \mathbb{R} \mid x(x+3) \neq 0\} =$$

$$= \{x \in \mathbb{R} \mid x \neq 0,\ x \neq -3\} =$$

$$= (-\infty; -3) \cup (-3; 0) \cup (0; +\infty)$$

$$\frac{x-3}{x+1} + \frac{1+x}{1-x} = 0$$

$$C.E. = \{x \in \mathbb{R} \mid x \neq -1;\ x \neq 1\} =$$

$$= (-\infty; -1) \cup (-1; 1) \cup (1; +\infty)$$

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

$$x - x^2 - 3 + 3x + 1 + x^2 + 2x = 0$$

$$6x - 2 = 0 \qquad \boxed{x = \frac{1}{3}}$$

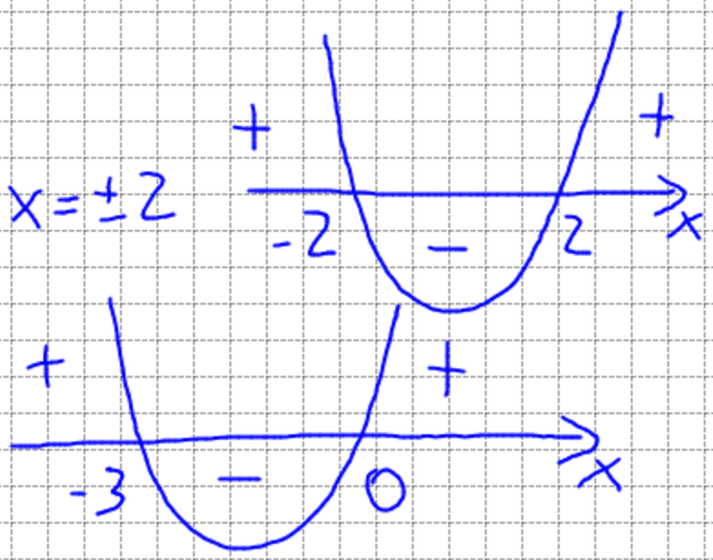
ESEMPIO

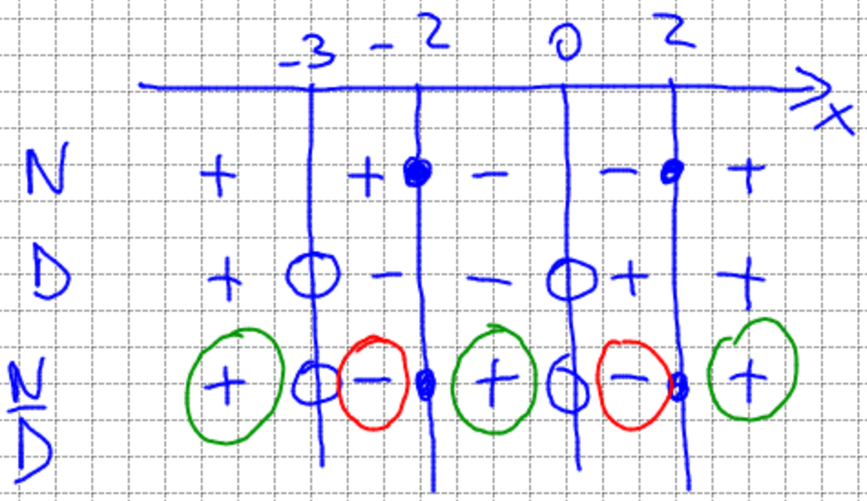
$$\frac{x^2-4}{x^2+3x} \geq 0$$

N) $x^2-4 \geq 0 \rightarrow x^2-4=0 \quad x=\pm 2$

D) $x^2+3x>0$

$x(x+3)=0 \quad x=0 \quad x=-3$





$$\text{Sol}: \left\{ x \in \mathbb{R} \mid x<-3 \cup -2 \leq x < 0 \cup x \geq 2 \right\} =$$

$$= (-\infty;-3) \cup [-2;0) \cup [2;+\infty)$$

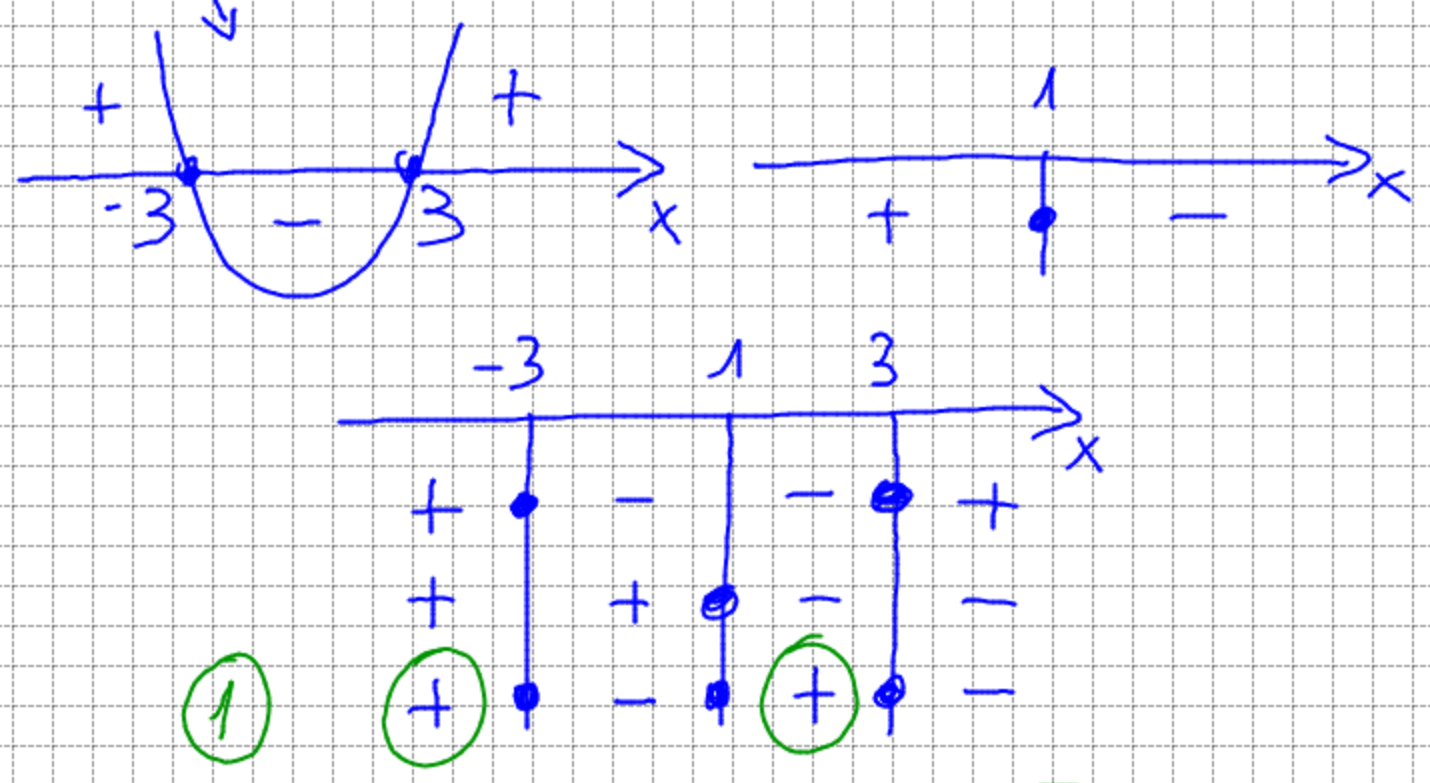
$$\frac{x^2-4}{x^2+3x} < 0 \qquad \text{Sol}: \left\{ x \in \mathbb{R} \mid -3<x<-2 \cup 0<x<2 \right\} =$$

$$(-3;-2) \cup (0;2)$$

SISTEMI DI DISEQUAZIONI

$$\begin{cases} (1)\ (x^2-9)(1-x) \geq 0 \\ (2)\ (x+4)^3(x-2)^2 \leq 0 \\ (3)\ \dfrac{2x}{3x-9} < 1 \end{cases}$$

(1) $(x^2-9)(1-x) \geq 0$ $\quad (x^2-9)(1-x)=0 \Rightarrow x=3,\ x=-3,\ x=1$



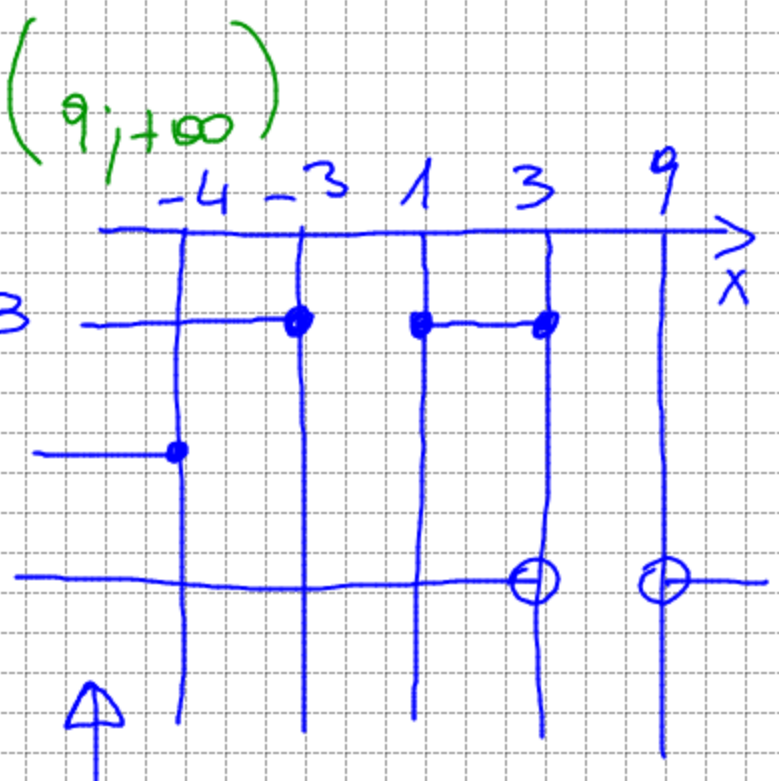
$S_1 = (-\infty;-3] \cup [1;3]$

(2) fare i conti a casa:

$S_2 = (-\infty;-4]$

(3) fare i conti a casa:

$S_3 = (-\infty;3) \cup (9;+\infty)$



$$\begin{cases} S_1 \\ S_2 \\ S_3 \end{cases} \begin{cases} x \leq -3 \cup 1 \leq x \leq 3 \\ x \leq -4 \\ x < 3 \cup x > 9 \end{cases}$$

$S_S = \{x \in \mathbb{R} \mid x \leq -4\} = (-\infty;-4]$