

DISEQUAZIONI DI 1° GRADO

$$ax + b > 0 \Rightarrow x > \frac{-b}{a} \quad \text{se } a > 0$$

$$x < \frac{-b}{a} \quad \text{se } a < 0$$

Es. $3x + 5 > 0 \Rightarrow x > -\frac{5}{3}$


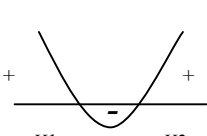

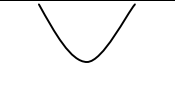
$$-2x + 7 > 0 \Rightarrow -2x > -7 \Rightarrow x < \frac{7}{2}$$

N.B.

$$5 > -2$$

$$-5 < 2$$

DISEQUAZIONI DI 2° GRADO

$a > 0$	$ax^2 + bx + c > 0$	$ax^2 + bx + c < 0$	
$\Delta > 0$	$x < x_1 \quad x > x_2$	$x_1 < x < x_2$	
$\Delta = 0$	$\forall x \in \mathbb{R} \neq x_1$	$\nexists x \in \mathbb{R}$	$x_1 = x_2$ 
$\Delta < 0$	$\forall x \in \mathbb{R}$	$\nexists x \in \mathbb{R}$	

$$\begin{cases} Y = ax^2 + bx + c \\ Y = 0 \end{cases}$$

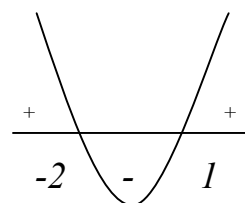
$$\Rightarrow ax^2 + bx + c = 0$$

Intersezione di una parabola con l'asse X

Esempio 1:

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

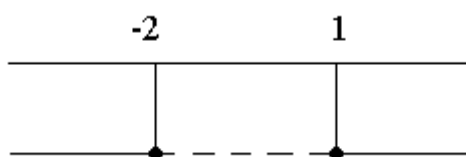
$$x^2 + x - 2 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1+8}}{2} = \begin{cases} -2 \\ 1 \end{cases}$$



$$x \leq -2$$

$$x \geq 1$$

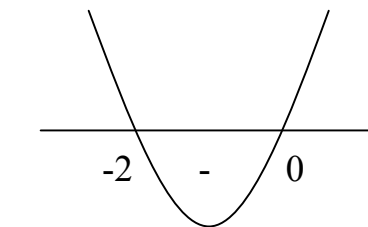
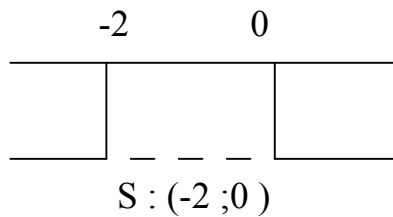
$$S: (-\infty; -2] \cup [1; +\infty)$$



Esempio n° 2:

$$\begin{aligned}x^2 + 2x < 0 \\ x^2 + 2x = 0 &\Rightarrow x(x+2) = 0\end{aligned}$$

$x = 0$
 $x = -2$



$$-2 < x < 0$$

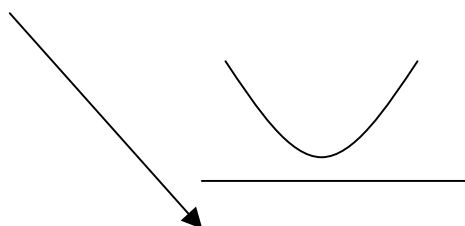
Esempio n° 3

$$x^2 + 7 > 0 \Rightarrow x^2 > -7 \quad \forall x \in \mathbb{R}$$

Esempio n° 4

$$x^2 + x + 3 < 0$$

$$\Delta = 1 - 12 < 0$$



$$S : \nexists x \in \mathbb{R}$$

Esempio n° 5

$$x^2 + 4x + 4 > 0$$

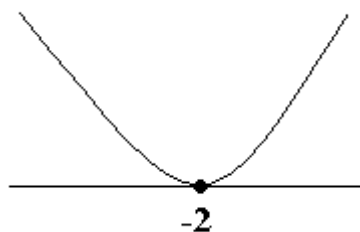
2°
modo

1° modo

$$\begin{aligned}(x+2)^2 > 0 \\ \forall x \neq -2\end{aligned}$$

$$x^2 + 4x + 4 = 0$$

$$x = \frac{-4 \pm \sqrt{0}}{2} = -2$$

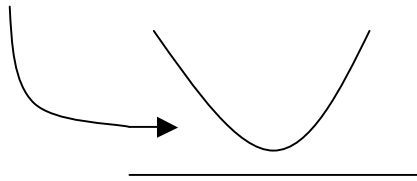


$$S : \forall x \in \mathbb{R} \neq -2$$

Esempio n° 6

$$x^2+x+5 > 0$$

$$\Delta = 1 - 20 < 0$$



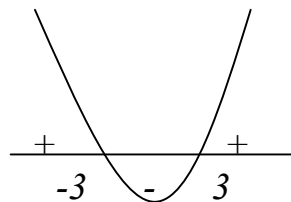
$$S: \forall x \in \mathbb{R}$$

Esempio n° 7

$$x^2 - 9 < 0$$

$$x^2 - 9 = 0 \Rightarrow x = \pm 3$$

$$-3 < x < 3$$



*N.B. : NON HA SENSO
SCRIVERE
 $x < \pm 3$*

DISEQUAZIONI FRATTE

$$\frac{\dots\dots}{\dots\dots} > 0 < 0$$

PONI SEMPRE

$$N > 0$$

$$D > 0$$

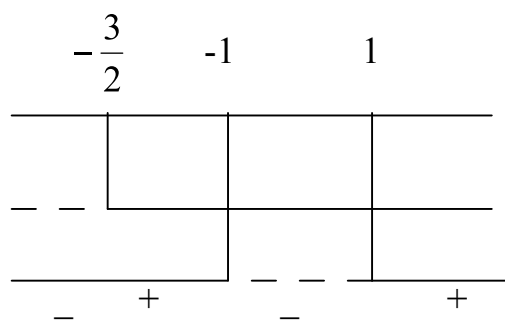
SI studia il segno
del grafico risolutivo

RICORDA SEMPRE IL TRATTEGGIO

Es n° 1

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

$N > 0$	$2x+3 > 0$	$x > -\frac{3}{2}$	
$D > 0$	$x^2-1 > 0$	$x < -1$	$x > 1$

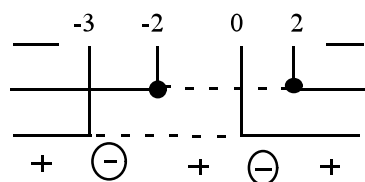


S: $-\frac{3}{2} < x < -1$ $x > 1$

Es n° 2

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

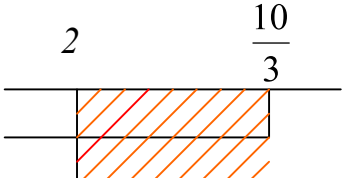
$N \geq 0$	$x^2-4 \geq 0$	$x \leq -2$	$x \geq 2$	N.B. $D > 0$
$D > 0$	$x^2+3x > 0$	$x < -3$	$x > 0$	$D=0$ <u>MAI!</u>



SISTEMI DI DISEQUAZIONI

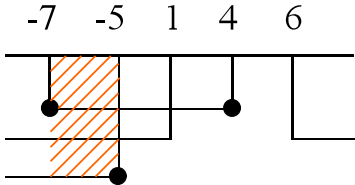
$$\begin{cases} \dots\dots\dots > < 0 \\ \dots\dots\dots > < 0 \end{cases}$$
 Si studiano separatamente le disequazioni e si vuole determinare l'intervallo in cui valgono contemporaneamente.

Esempio n° 1

$$\begin{cases} 2x-4 > 0 \\ 3x-10 < 0 \end{cases} \Rightarrow \begin{cases} x > 2 \\ x < \frac{10}{3} \end{cases}$$


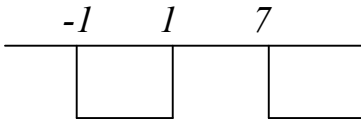
S: $2 < x < \frac{10}{3}$

Esempio n° 2

$$\begin{cases} x^2 + 3x + 28 \leq 0 \\ x^2 - 7x + 6 > 0 \\ 8x + 40 \leq 0 \end{cases} \Rightarrow \begin{cases} -7 \leq x \leq 4 \\ x < 1 \quad x > 6 \\ x \leq -5 \end{cases}$$


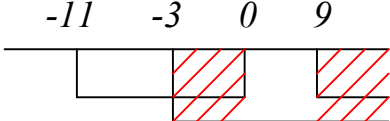
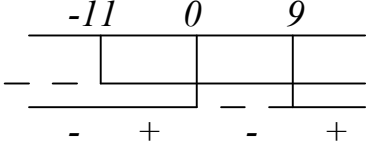
S: $-7 \leq x \leq -5$

Esempio n° 3

$$\begin{cases} x^2 - 1 > 0 \\ x - 7 > 0 \end{cases} \Rightarrow \begin{cases} -1 < x < 1 \\ x > 7 \end{cases}$$


S: 0

Esercizio n° 4

$$\begin{cases} x + 3 > 0 \\ \frac{x + 11}{x^2 - 9x} > 0 \end{cases} \Rightarrow \begin{cases} x > -3 \\ x + 11 > 0 \quad x > -11 \\ x^2 - 9x > 0 \quad x < 0 \quad x > 9 \end{cases}$$



S: $-3 < x < 0 \quad x > 9$