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1) DISEQUAZIONI

2) ELEMENTI DI GEOMETRIA ANALITICA

3) TRIGONOMETRIA

$$3x + 2 < 4x - 3$$

$$3x - 4x < -2 - 3$$

$$-x < -5$$

$$x > 5$$

$$ax^2 + bx + c \geq 0$$

$$a \neq 0 \quad a > 0$$

1)  $\Delta > 0$  2 real roots

2)  $\Delta = 0$  2 real coincident

3)  $\Delta < 0$   $\emptyset$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

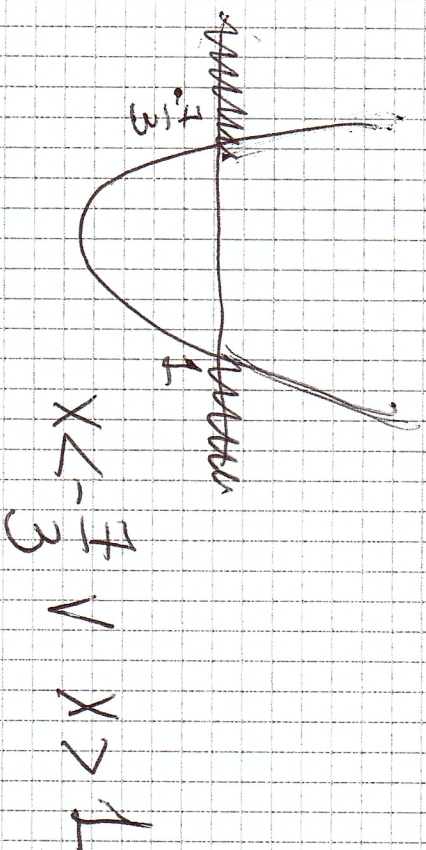
$$\Delta = b^2 - 4ac$$

3

$$3x^2 + 4x - 7 > 0$$

$$\Delta = 16 - 4 \cdot 3 \cdot (-7)$$

$$= 16 + 84 = 100 = 10^2$$



$$5x^2 - 121x + 116 < 0$$

$$x_1 x_2 = \frac{116}{5}$$

$$x_2 = \frac{116}{5}$$

$$1 < x < \frac{116}{5}$$

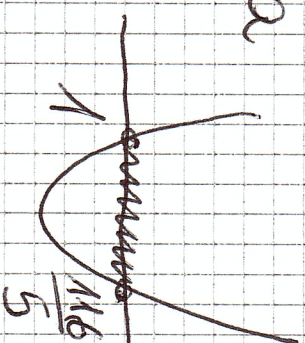
$$x_1 + x_2 = -\frac{b}{a}$$

$$x_1 x_2 = \frac{c}{a}$$

$$x = \frac{-4 \pm 10}{6}$$

$$\frac{6}{6} = 1$$

$$-\frac{14}{6} = -\frac{7}{3}$$



$$\Delta = 0$$

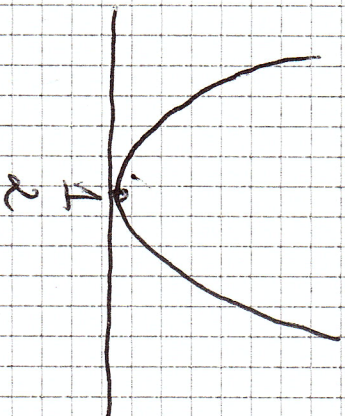
$$4x^2 - 4x + 1 \geq 0$$

$$\Delta = 16 - 16 = 0$$

16

$$(2x-1)^2 \geq 0 \quad \forall x \in \mathbb{R}$$

$$(2x-1)^2 > 0 \quad \forall x \neq \frac{1}{2}$$

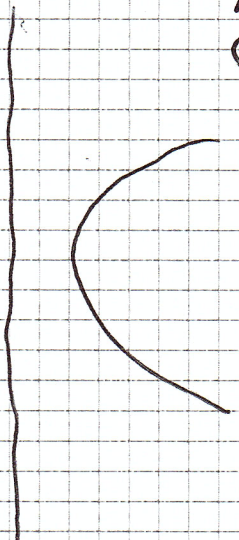


$$\Delta < 0$$

$$3x^2 + 4x + 8 < 0$$

$$\Delta = 16 - 4 \cdot 3 \cdot 8 < 0$$

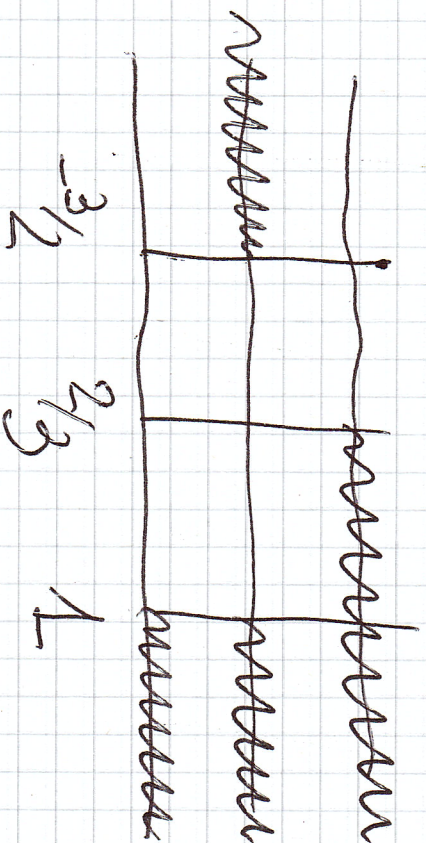
$\emptyset$



# Sistemi di disequazioni

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

$$\begin{cases} x > \frac{2}{3} \\ x < -\frac{3}{2} \vee x > 1 \end{cases}$$



$$x > 1$$

# DISEQUAZIONI FRATTI

16

$$\frac{x-1}{2x+5} > 0$$

$$\frac{x-1}{2x+5} = 0$$

$$\frac{x-1}{\cancel{2x+5}} = \frac{0}{\cancel{2x+5}}$$

$$x \neq -\frac{5}{2}$$

$$x = 1$$

$$N. = x - 1 > 0 \quad x > 1$$

$$D. = 2x + 5 > 0 \quad x > -\frac{5}{2}$$

| N.               | D.               |                  |
|------------------|------------------|------------------|
| -                | -                | +                |
| -                | +                | +                |
| +                | -                | -                |
| +                | +                | +                |
| <del>-----</del> | <del>-----</del> | <del>-----</del> |
| <del>-5/2</del>  | 1                |                  |

$$x < -\frac{5}{2} \vee x > 1$$

$$\frac{x-1}{2x+5} > 0$$

$$(x-1)(2x+5) > 0 \quad 1, -\frac{5}{2}$$

$$x < -\frac{5}{2} \vee x > 1$$

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$$|x| = \begin{cases} x \\ -x \end{cases}$$

$$\begin{array}{l} x \quad x \geq 0 \\ -x \quad x < 0 \end{array}$$

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$$|+2| = +2 \quad |-5| = +5 \quad |\pi-3| = \pi-3$$

$$|1-\sqrt{2}| = -1+\sqrt{2} \quad |x| \geq 0 \quad \forall x \quad |x|=0 \Leftrightarrow x=0$$

$$|x| = 2 \quad x=2, -2 \quad |x| = \frac{1}{2} \quad x=\frac{1}{2}, -\frac{1}{2}$$

$$|x| = -1 \quad \text{imp}$$

~~QED~~

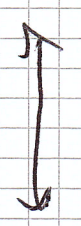
$$|P(x)| < Q(x)$$

$$|P(x)| > Q(x)$$

$$\begin{cases} P(x) < Q(x) \\ P(x) > -Q(x) \end{cases}$$

$$P(x) > Q(x) \vee P(x) < -Q(x)$$

$$|2x+1| > 3x-2$$



$$2x+1 > 3x-2 \vee 2x+1 < -3x+2$$

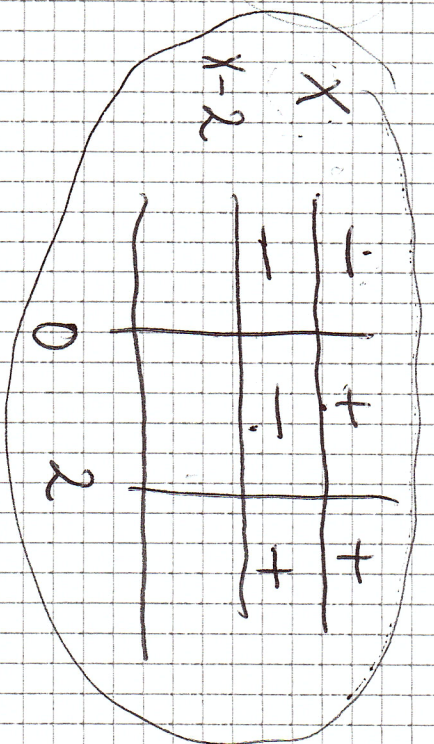
$$-x > -3 \vee 5x < 1$$

$$x < 3 \vee x < 1/5$$

~~xxxxxxxxxxxx~~  
~~1/5~~ 3

$$x < 3$$

$$\frac{x-2}{x+3}$$



10

$$\left. \begin{array}{l} x < 0 \\ \cancel{x-1} \cdot \cancel{x+2} + 3 \end{array} \right\}$$

$$\left. \begin{array}{l} x > 0 \\ y > 0 \end{array} \right\}$$

$$+ \left\{ \begin{array}{l} 0 \leq x < 2 \\ x < -x + 2 + 3 \end{array} \right.$$

$$0 \leq x < 2$$
$$2x < 5 \Leftrightarrow x < \frac{5}{2}$$

$$\begin{array}{r} 60 \\ \times 2 \\ \hline 120 \end{array}$$

$$x^2 - 2 + 3$$

$$+ \int_0^1 x^2 dx$$

天

$$|x| < |x-2| + 3$$

$$\left\{ \begin{array}{l} x < |x-2| + 3 \\ x > -|x-2| - 3 \end{array} \right.$$

$$\left\{ \begin{array}{l} x-3 < |x-2| \Leftrightarrow |x-2| > x-3 \quad * \\ |x-2| > -x-3 \quad (**) \end{array} \right.$$

$$|11$$

$$\left\{ \begin{array}{l} (*) \quad \cancel{x-2 > x-3} \vee x-2 < -x+3 \\ (**) \quad x-2 > -x-3 \vee \cancel{x-2 < x+3} \end{array} \right.$$

$$\left\{ \begin{array}{l} \mathbb{R} \vee 2x < 5 \quad x < \frac{5}{2} \\ 2x > -1 \quad x > -\frac{1}{2} \vee \mathbb{R} \end{array} \right.$$

$$\mathbb{R}$$

$$\mathbb{R}$$