16/5/2022

309 $(|x|-2x+5)(3-|2x-1|)=0$ $[-1;\ 2;\ 5]$

↳ LEGGE DI ANNULLAMENTO DEL PRODOTTO

$|x|-2x+5=0 \quad \vee \quad 3-|2x-1|=0$

$|x|=2x-5 \quad \vee \quad |2x-1|=3$

$\begin{cases} 2x-5\geq 0 \\ x=\pm(2x-5) \end{cases} \quad \vee \quad 2x-1=\pm 3$

$\begin{cases} x\geq \frac{5}{2} \\ x=2x-5 \end{cases} \vee \begin{cases} x\geq \frac{5}{2} \\ x=-2x+5 \end{cases} \quad \vee \quad 2x-1=3 \quad \vee \quad 2x-1=-3$

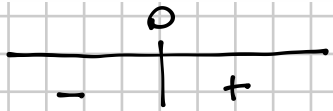
$\begin{cases} x\geq \frac{5}{2} \\ x=5 \end{cases} \vee \begin{cases} x\geq \frac{5}{2} \\ x=\frac{5}{3} \end{cases} \quad \vee \quad x=2 \quad \vee \quad x=-1$

$x=5 \qquad \not\emptyset$ IMP.

$$\boxed{x=5 \ \vee \ x=2 \ \vee \ x=-1}$$

310 $x^4 - 5x|x| + 4 = 0$ [1; 2]

$x > 0$



$$\begin{cases} x < 0 \\ x^4 + 5x^2 + 4 = 0 \end{cases} \quad \vee \quad \begin{cases} x \geq 0 \\ x^4 - 5x^2 + 4 = 0 \end{cases}$$

$t = x^2$

$t^2 + 5t + 4 = 0$

$(t+4)(t+1) = 0$

$t = -4 \vee t = -1$

$x^2 = -4 \vee x^2 = -1$

IMPOSS.

$t = x^2$

$t^2 - 5t + 4 = 0$

$(t-4)(t-1) = 0$

$t = 4 \vee t = 1$

$x^2 = 4 \vee x^2 = 1$

$x = \pm 2 \vee x = \pm 1$

↳ perché $x \geq 0$

$\boxed{x = 2 \vee x = 1}$

282 $|x^2 - 2x| = |3x - x^2|$ $\left[0; \frac{5}{2}\right]$

$x^2 - 2x = \pm(3x - x^2)$

$x^2 - 2x = -3x + x^2$ $\vee$ $x^2 - 2x = 3x - x^2$

$x = 0$

$2x^2 - 5x = 0$

$x(2x - 5) = 0$

$x = 0 \vee 2x - 5 = 0$

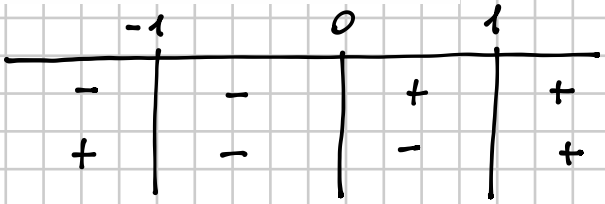
$x = 0 \vee x = \frac{5}{2}$

$\boxed{x = 0 \vee x = \frac{5}{2}}$

293 $|x|+|x^2-1|=1$ $[-1;\ 0;\ 1]$

$x>0$

$x^2-1>0 \qquad x<-1 \ \vee \ x>1$



$$\begin{cases} x<-1 \\ -x+x^2-1=1 \end{cases} \vee \begin{cases} -1\le x<0 \\ -x-x^2+1=1 \end{cases} \vee \begin{cases} 0\le x<1 \\ x-x^2+1=1 \end{cases} \vee \begin{cases} x\ge 1 \\ x+x^2-1=1 \end{cases}$$

$$\begin{cases} x<-1 \\ x^2-x-2=0 \end{cases} \vee \begin{cases} -1\le x<0 \\ x(x+1)=0 \end{cases} \vee \begin{cases} 0\le x<1 \\ x(1-x)=0 \end{cases} \vee \begin{cases} x\ge 1 \\ x^2+x-2=0 \end{cases}$$

$(x-2)(x+1)=0$

$x=2$
$x=-1$] N.Acc.

$x=0$ N.A.

$x=-1$

$x=0$

$x=1$ N.A.

$(x+2)(x-1)=0$

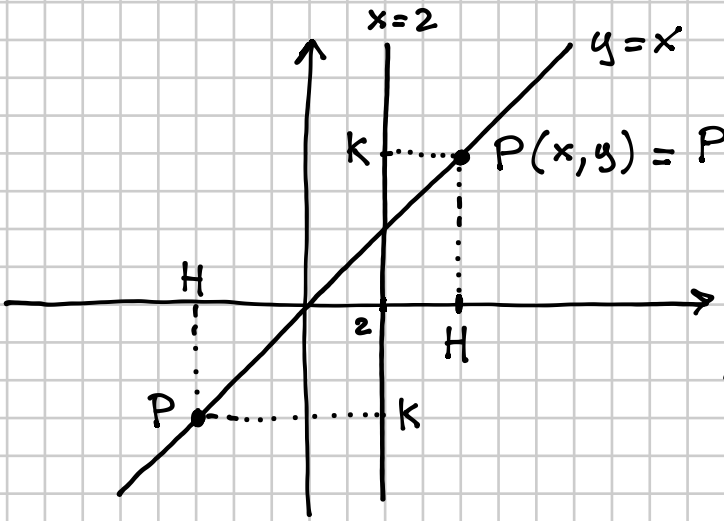
$x=-2$ N.A.

$x=1$

$$\boxed{x=-1 \ \vee \ x=0 \ \vee \ x=1}$$

205 Determina un punto P, sulla bisettrice del primo e del terzo quadrante, in modo che dette H e K le proiezioni di P sull'asse x e sulla retta di equazione $x = 2$, si abbia $\overline{PH} + \overline{PK} = 5$.

$\left[P_1\left(\frac{7}{2}, \frac{7}{2}\right); P_2\left(-\frac{3}{2}, -\frac{3}{2}\right)\right]$



$\overline{PH} + \overline{PK} = 5$

$\overline{PH} = |x| \quad \overline{PK} = |x-2|$

$|x| + |x-2| = 5$

da risolvere

$x > 0$

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

	0		2	
x	−	|	+	+
$x-2$	−	|	−	+

$$\begin{cases} x < 0 \\ -x - x + 2 = 5 \end{cases} \vee \begin{cases} 0 \le x < 2 \\ \cancel{x} - x + 2 = 5 \end{cases} \vee \begin{cases} x \ge 2 \\ x + x - 2 = 5 \end{cases}$$

$$\begin{cases} x < 0 \\ -2x = 3 \end{cases} \vee \begin{cases} \\ 2 = 5 \end{cases} \text{ IMPOSS.} \vee \begin{cases} x \ge 2 \\ 2x = 7 \end{cases}$$

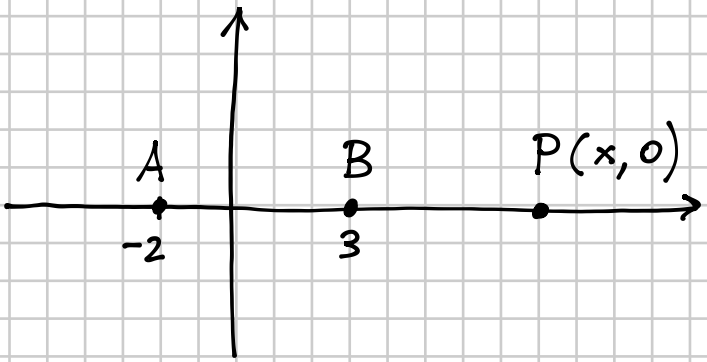
$x = -\frac{3}{2} \qquad x = \frac{7}{2}$

$x = -\frac{3}{2} \vee x = \frac{7}{2}$

$\boxed{P_1\left(-\frac{3}{2}, -\frac{3}{2}\right) \quad P_2\left(\frac{7}{2}, \frac{7}{2}\right)}$

201 Determina un punto P, sull'asse x, in modo che la sua distanza dal punto $A(-2,0)$ sia uguale al doppio della distanza da $B(3,0)$.

$\left[P_1\left(\frac{4}{3},0\right); P_2(8,0)\right]$



$\overline{PA} = |x-(-2)| = |x+2|$

$\overline{PB} = |x-3|$

$\overline{PA} = 2\,\overline{PB}$

$|x+2| = 2|x-3|$

$x+2 = \pm 2(x-3)$

$x+2 = -2(x-3) \quad \vee \quad x+2 = 2(x-3)$

$x+2 = -2x+6 \quad \vee \quad x+2 = 2x-6$

$3x = 4 \qquad\qquad x = 8$

$\vee$

$x = \frac{4}{3}$

$P_1\left(\frac{4}{3},0\right) \qquad P_2(8,0)$