

193 $|x| - 1 = |x^2 - 2x|$

$$\left[\frac{3 + \sqrt{5}}{2}; \frac{1 + \sqrt{5}}{2} \right]$$

31/5/2021

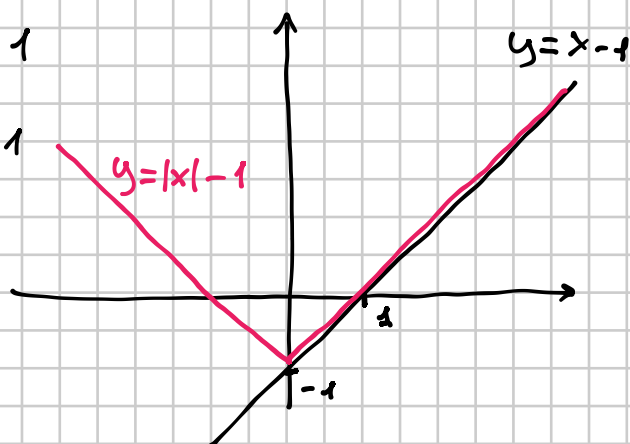
INTERPRETARE GRAFICAMENTE E RISOLVERE ALGEBRICAMENTE

$$\begin{cases} y = |x| - 1 \\ y = |x^2 - 2x| \end{cases}$$

$$y = |x| - 1$$

$$1) y = x - 1$$

$$2) y = |x| - 1$$



$$y = |x^2 - 2x|$$

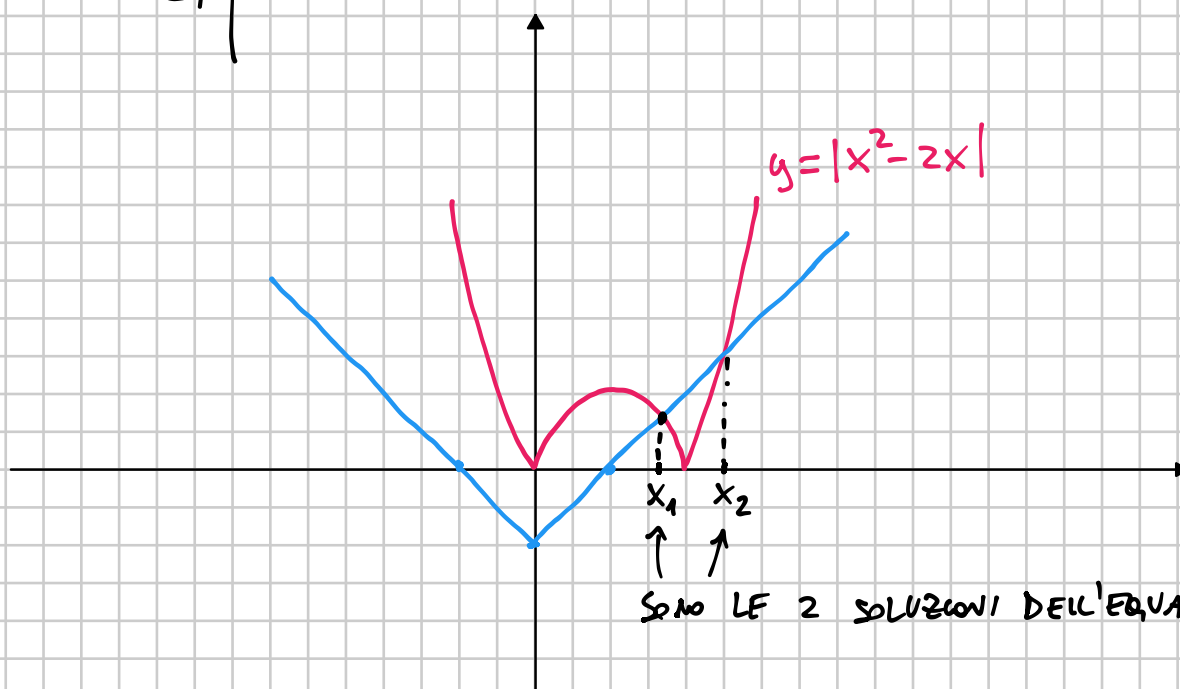
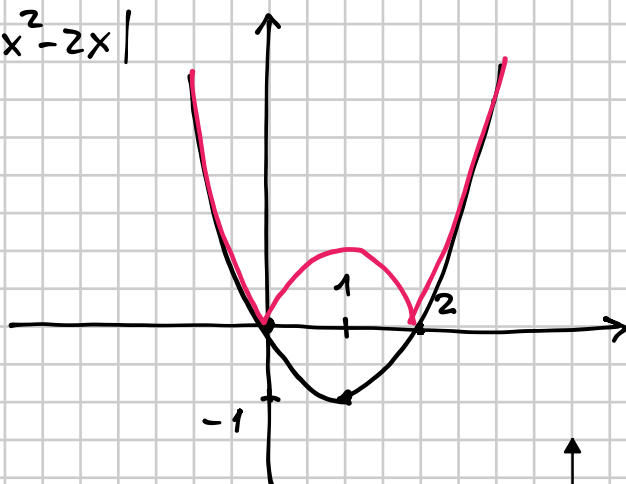
$$1) y = x^2 - 2x$$

$$V(1, -1)$$

$$2) y = |x^2 - 2x|$$

x	y
0	0
2	0

$$\leftarrow x^2 - 2x = 0 \quad x(x - 2) = 0 \quad \begin{cases} x = 0 \\ x = 2 \end{cases}$$



SONO LE 2 SOLUZIONI DELL'EQUAZIONE

RISOLUZIONE ALGEBRICA:

$$|x| - 1 = |x^2 - 2x|$$

$$1) x > 0$$

$$2) x^2 - 2x > 0 \quad x(x-2) > 0 \quad x < 0 \vee x > 2$$

		0		2	
x	-		+		+
$x^2 - 2x$	+		-		+

$$\begin{cases} x \leq 0 \\ -x - 1 = x^2 - 2x \end{cases} \vee \begin{cases} 0 \leq x \leq 2 \\ x - 1 = -x^2 + 2x \end{cases} \vee \begin{cases} x \geq 2 \\ x - 1 = x^2 - 2x \end{cases}$$

$$\begin{cases} x \leq 0 \\ x^2 - x + 1 = 0 \end{cases} \vee \begin{cases} 0 \leq x \leq 2 \\ x^2 - x - 1 = 0 \end{cases} \vee \begin{cases} x \geq 2 \\ x^2 - 3x + 1 = 0 \end{cases}$$

$$\Delta = 1 - 4 < 0$$

\emptyset

$$\Delta = 1 + 4 = 5$$

$$x = \frac{1 \pm \sqrt{5}}{2} = \begin{cases} \frac{1 - \sqrt{5}}{2} \text{ N.A.} \\ \frac{1 + \sqrt{5}}{2} \text{ OK} \end{cases}$$

$$\Delta = 9 - 4 = 5$$

$$x = \frac{3 \pm \sqrt{5}}{2} = \begin{cases} \frac{3 - \sqrt{5}}{2} \text{ N.A.} \\ \frac{3 + \sqrt{5}}{2} \text{ OK} \end{cases}$$

$$\boxed{x = \frac{1 + \sqrt{5}}{2} \vee x = \frac{3 + \sqrt{5}}{2}}$$

186 $|x - 3| = \frac{x}{2} + 1$

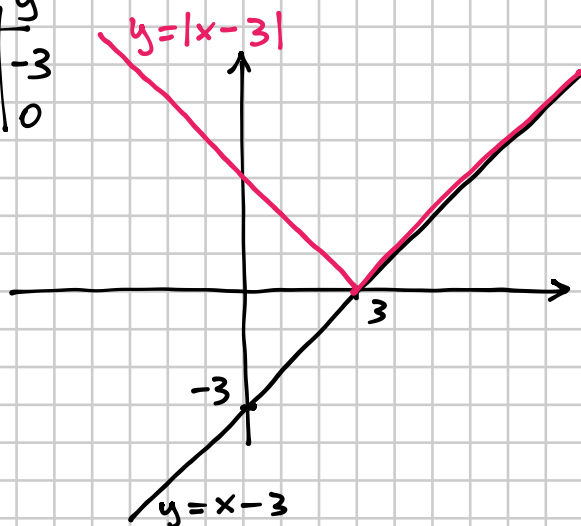
$\left[\frac{4}{3}; 8\right]$

INTERPRETAZIONE GRAFICA

$$\begin{cases} y = |x - 3| \\ y = \frac{x}{2} + 1 \end{cases}$$

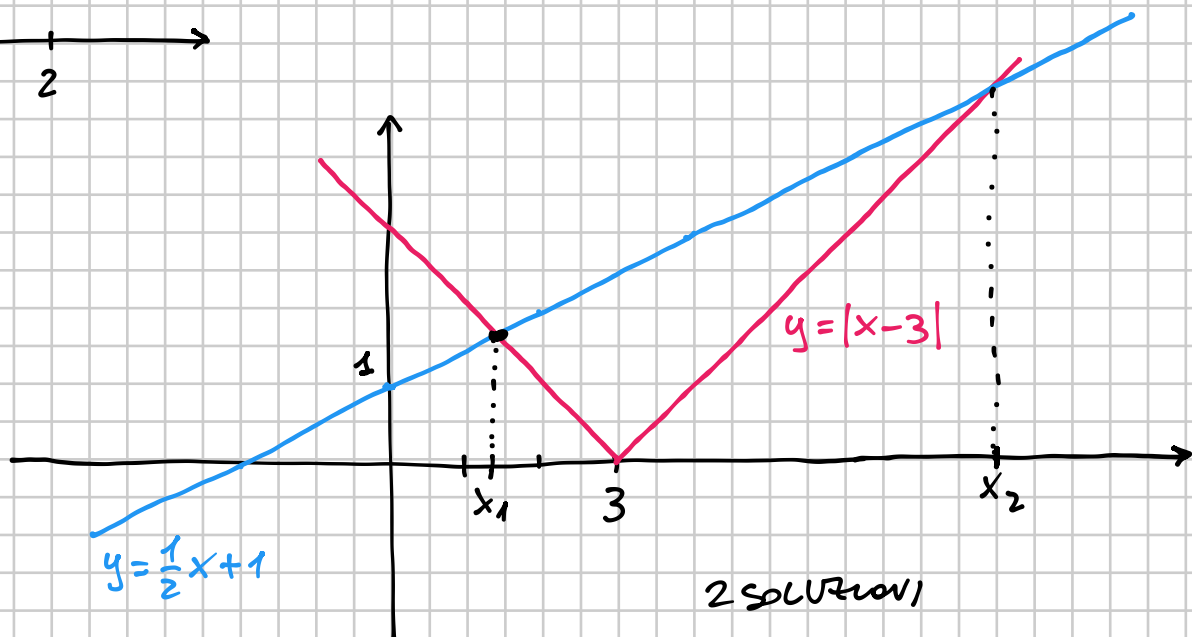
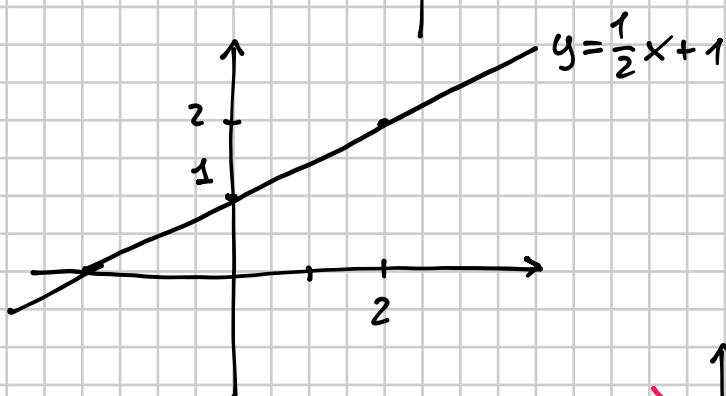
$$y = x - 3 \Rightarrow y = |x - 3|$$

x	y
0	-3
3	0



$$y = \frac{1}{2}x + 1$$

x	y
0	1
2	2



$$|x - 3| = \frac{x}{2} + 1$$

$$\begin{cases} \frac{x}{2} + 1 \geq 0 \\ x - 3 = \pm \left(\frac{x}{2} + 1\right) \end{cases} \Rightarrow \begin{cases} x \geq -2 \\ x - 3 = \frac{x}{2} + 1 \end{cases} \vee \begin{cases} x \geq -2 \\ x - 3 = -\frac{x}{2} - 1 \end{cases}$$

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

$$\begin{cases} x \geq -2 \\ \frac{2x-6}{\cancel{2}} = \frac{x+2}{\cancel{2}} \end{cases}$$

$$x = 8 \text{ OK}$$

$$\begin{cases} x \geq -2 \\ \frac{2x-6}{\cancel{2}} = \frac{-x-2}{\cancel{2}} \end{cases}$$

$$3x = 4$$

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

$$x = 8 \vee x = \frac{4}{3}$$

187 $|2x - 1| - x = x + 2$

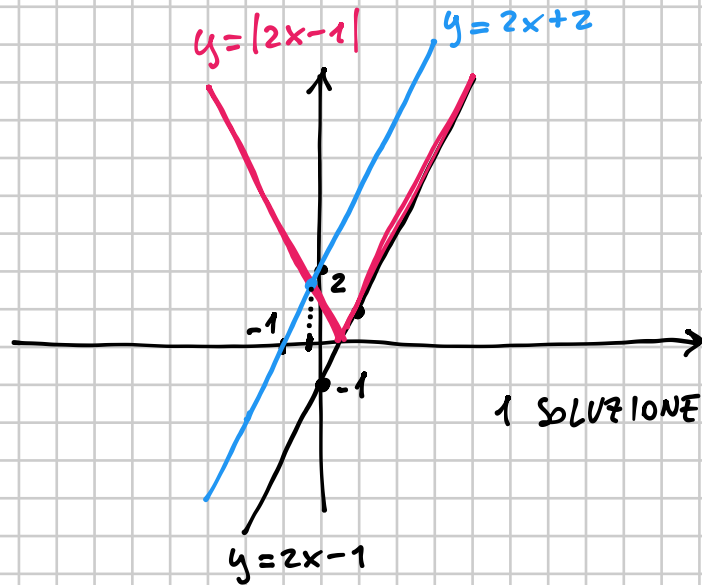
$\left[-\frac{1}{4}\right]$

$$|2x - 1| = 2x + 2$$

$$\begin{cases} y = |2x - 1| \\ y = 2x + 2 \end{cases}$$

$$y = 2x - 1 \quad \begin{array}{c|c} x & y \\ \hline 0 & -1 \\ 1 & 1 \end{array}$$

$$y = 2x + 2 \quad \begin{array}{c|c} x & y \\ \hline 0 & 2 \\ -1 & 0 \end{array}$$



$$|2x - 1| = 2x + 2$$

$$\begin{cases} 2x + 2 \geq 0 \\ 2x - 1 = \pm(2x + 2) \end{cases} \Rightarrow \begin{cases} x \geq -1 \\ \cancel{2x - 1 = 2x + 2} \\ \emptyset \end{cases} \vee \begin{cases} x \geq -1 \\ 2x - 1 = -2x - 2 \end{cases}$$

$$4x = -1$$

$$x = -\frac{1}{4} \text{ OK.}$$

$$\boxed{x = -\frac{1}{4}}$$

188 $|x^2 - 4| = 6$

$[\pm\sqrt{10}]$

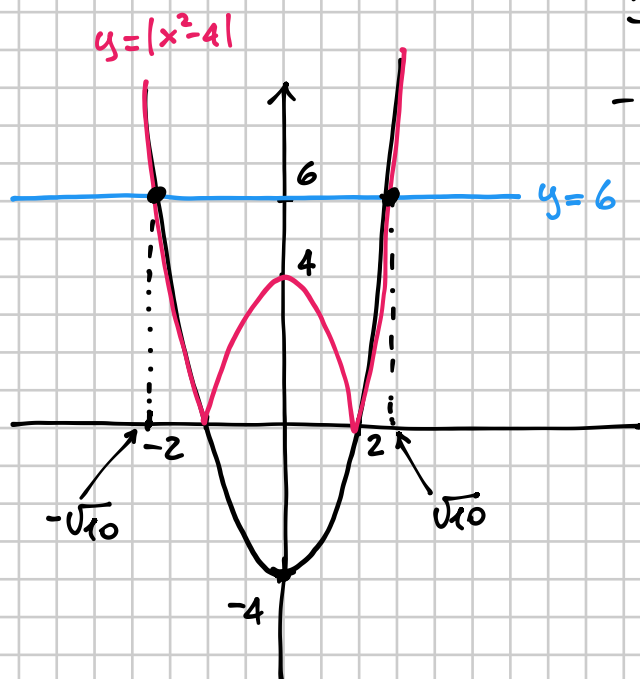
$$\begin{cases} y = |x^2 - 4| \\ y = 6 \end{cases}$$

$$y = x^2 - 4$$

$$V(0, -4)$$

x	y
2	0
-2	0

$$x^2 - 4 = 0 \quad x = \pm 2$$



$$|x^2 - 4| = 6$$

$$x^2 - 4 = \pm 6$$

$$x^2 - 4 = -6 \quad \vee \quad x^2 - 4 = 6$$

$$x^2 = -2 \quad \vee \quad x^2 = 10$$

$$\emptyset$$

$$x = \pm \sqrt{10}$$