$$f(x) = x - \sqrt{x^2 - 3x + 2}$$

$$x = \frac{3 \pm \sqrt{9-8}}{2} = \frac{3 \pm 1}{2} \begin{matrix} \nearrow 1 \\ \searrow 2 \end{matrix}$$

$x^2 - 3x + 2 \geq 0$ $\quad\quad$ $x \leq 1 \; ; \; x \geq 2$

CE: $]-\infty, 1] \cup [2, +\infty[$

POSITIVITÀ

$x - \sqrt{x^2 - 3x + 2} \geq 0 \; ; \quad x \geq \sqrt{x^2 - 3x + 2}$

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

$$\begin{cases} x > 0 \\ x \geq \frac{2}{3} \end{cases} \quad\quad x \geq \frac{2}{3}$$

Intersezione con l'asse y

$x = 0$ $\quad\quad$ $y = 0 - \sqrt{2} = -\sqrt{2}$

$f(1) = 1 - \sqrt{0}$

$f(2) = 2$

$$\lim_{x \to +\infty} x - \sqrt{x^2 - 3x + 2} =$$

$$= \lim_{x \to +\infty} \frac{\cancel{x^2} - \cancel{x^2} + 3x - 2}{x + \sqrt{x^2 - 3x + 2}} = \frac{3}{2}$$

$$\cancel{m = \lim_{x \to -\infty} \frac{f(x)}{x} = \lim_{x \to -\infty} x^2 - x^2 + 3x -}$$

$$\lim_{x \to -\infty} x - \sqrt{x^2 - 3x + 2} = -\infty$$

$$m = \lim_{x \to -\infty} \frac{x - \sqrt{x^2 - 3x + 2}}{x} = \lim_{x \to -\infty} \cancel{1 - \sqrt{1 - \frac{3}{x} + \frac{2}{x^2}}}$$

$$= \cancel{\lim_{x \to -\infty} \frac{x^2 - x^2 + 3x - 2}{x^2 + x^2 \sqrt{1 - \frac{3}{x} + \frac{2}{x^2}}}} =$$

$$= \cancel{\lim_{x \to -\infty} \frac{1 + 1 + \frac{3}{x} - \frac{2}{x^2}}{\quad}}$$

$$= \lim_{x \to -\infty} \frac{x - |x| \sqrt{1 - \frac{3}{x} + \frac{2}{x^2}}}{x} =$$

$$= \lim_{x \to -\infty} 1 + \sqrt{1 - \frac{3}{x} + \frac{2}{x^2}} = 2$$

$$n = \lim_{x \to -\infty} x - \sqrt{x^2 - 3x + 2} - 2x = \lim_{x \to -\infty} -x - \sqrt{x^2 - 3x + 2}$$

$$n = \cancel{\lim_{x \to +\infty} -\left(x + \sqrt{x^2 - 3x + 2}\right)} = \lim_{y \to +\infty} y - \sqrt{y^2 + 3y + 2}$$

$$= \cancel{\lim_{x \to -\infty} - \frac{x^2 + x^2 - 3x + 2}{x - \sqrt{\quad}}} = \lim_{y \to +\infty} \frac{\cancel{y^2} - \cancel{y^2} - 3y - 2}{y + \sqrt{y^2 + 3y + 2}} = -\frac{3}{2}$$

$$m = \cancel{\lim_{x \to -\infty} \frac{f(x)}{x} = \lim_{x \to -\infty} x^2 - x^2 + 3x -}$$

$$\lim_{x \to -\infty} x - \sqrt{x^2 - 3x + 2} = -\infty$$

$$m = \lim_{x \to -\infty} \frac{x - \sqrt{x^2 - 3x + 2}}{x} = \lim_{x \to -\infty} \cancel{1 - \sqrt{1 - \frac{3}{x} + \frac{2}{x^2}}}$$

$$= \cancel{\lim_{x \to -\infty} \frac{x^2 - x^2 + 3x - 2}{x^2 + x^2\sqrt{1 - \frac{3}{x} + \frac{2}{x^2}}}} =$$

$$= \cancel{\lim_{x \to -\infty} \frac{1 + 1 + \frac{3}{x} - \frac{2}{x^2}}{}}$$

$$= \lim_{x \to -\infty} \frac{x - |x|\sqrt{1 - \frac{3}{x} + \frac{2}{x^2}}}{x} =$$

$$= \lim_{x \to -\infty} 1 + \sqrt{1 - \frac{3}{x} + \frac{2}{x^2}} = 2$$

$$n = \lim_{x \to -\infty} x - \sqrt{x^2 - 3x + 2} - 2x = \lim_{x \to -\infty} -x - \sqrt{x^2 - 3x + 2}$$

$$\cancel{n = \lim_{x \to +\infty} \left(-(x + \sqrt{x^2 - 3x + 2})\right)} = \lim_{y \to +\infty} y - \sqrt{y^2 + 3y + 2}$$

$$= \cancel{\lim_{x \to -\infty} - \frac{x^2 + x^2 - 3x + 2}{x - \sqrt{}}} = \lim_{y \to +\infty} \frac{\cancel{y^2} - \cancel{y^2} - 3y - 2}{y + \sqrt{y^2 + 3y + 2}} = -\frac{3}{2}$$

MAX E MIN

$$f'(x) = 1 - \frac{1}{2\sqrt{x^2-3x+2}}(2x-3) =$$

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

$$f'(x) \geq 0 \qquad \sqrt{x^2-3x+2} \geq \frac{2x-3}{2}$$

$$\begin{cases} \frac{2x-3}{2} < 0 \\ x^2-3x+2 \geq 0 \end{cases} \qquad \begin{cases} \frac{2x-3}{2} \geq 0 \\ x^2-3x+2 \geq \frac{(2x-3)^2}{4} \end{cases}$$

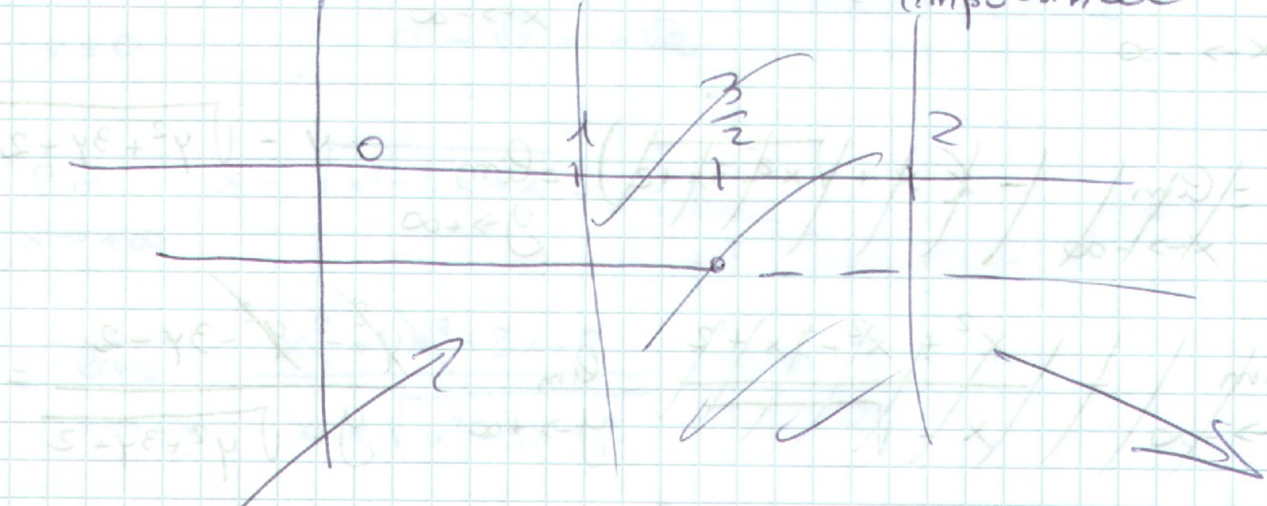
$$\downarrow \qquad\qquad\qquad \downarrow$$

$$\begin{cases} x < \frac{3}{2} \\ x \leq 1 \ , \ x \geq 2 \end{cases} \qquad \begin{cases} x \geq \frac{3}{2} \\ 4x^2+12x+8 \geq 4x^2+9-12x \end{cases}$$

$$\downarrow \qquad\qquad\qquad \downarrow$$

$$x < \frac{3}{2} \qquad\qquad \begin{cases} x \geq \frac{3}{2} \\ 8 \geq 9 \end{cases}$$

impossibile



MAX E MIN

$$f'(x) = 1 - \frac{1}{2\sqrt{x^2-3x+2}}(2x-3) =$$

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

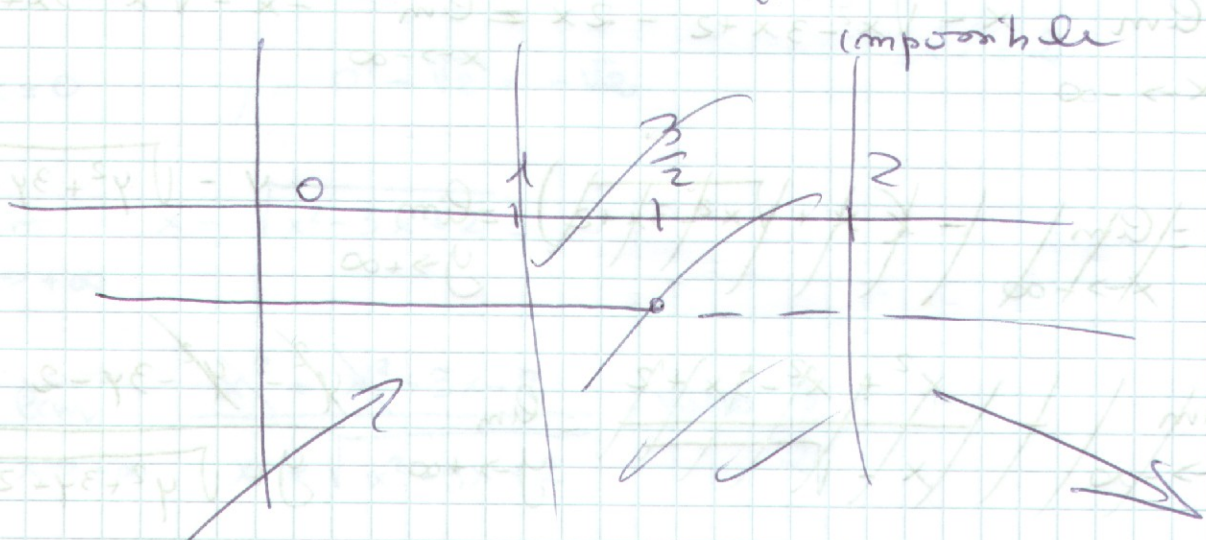
$$f'(x) \geq 0 \qquad \sqrt{x^2-3x+2} \geq \frac{2x-3}{2}$$

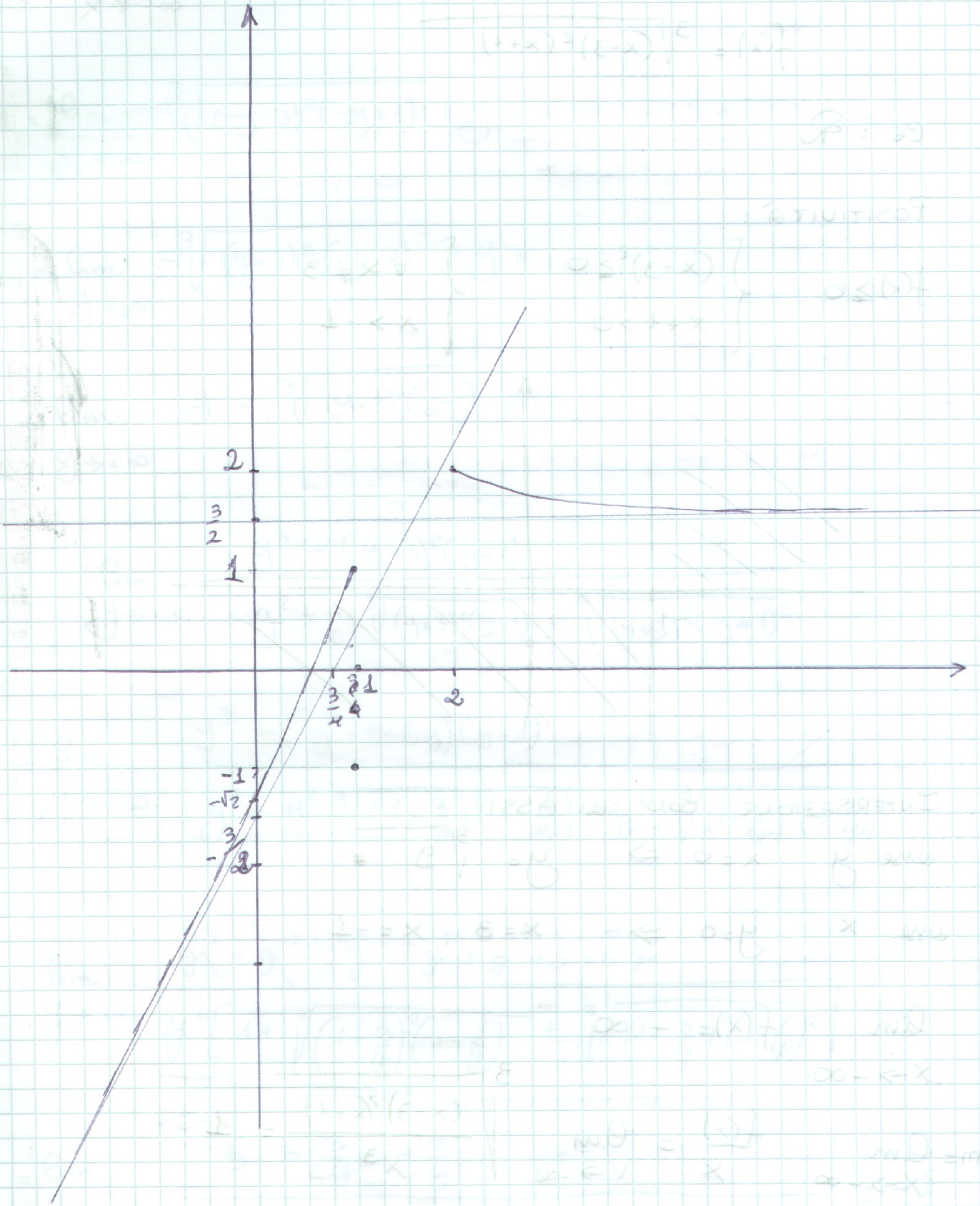
$$\begin{cases} \dfrac{2x-3}{2} < 0 \\ x^2-3x+2 \geq 0 \end{cases} \qquad \begin{cases} \dfrac{2x-3}{2} \geq 0 \\ x^2-3x+2 \geq \dfrac{(2x-3)^2}{4} \end{cases}$$

$$\begin{cases} x < \dfrac{3}{2} \\ x \leq 1 \;,\; x \geq 2 \end{cases} \qquad \begin{cases} x \geq \dfrac{3}{2} \\ 4x^2+12x+8 \geq 4x^2+9-12x \end{cases}$$

$$x < \frac{3}{2} \qquad \begin{cases} x \geq \dfrac{3}{2} \\ 8 \geq 9 \end{cases}$$

impossibile




2
3/2
1
-1
-√2
-3/2
3/4
1
2