22/3/2021

337 $(x-2)^3 - 2x^2 + x + 6 < 0$

1] $x^3 - 6x^2 + 12x - 8 - 2x^2 + x + 6 < 0$

$x^3 - 8x^2 + 13x - 2 < 0$

	1	−8	13	−2
2		2	−12	2
	1	−6	1	//

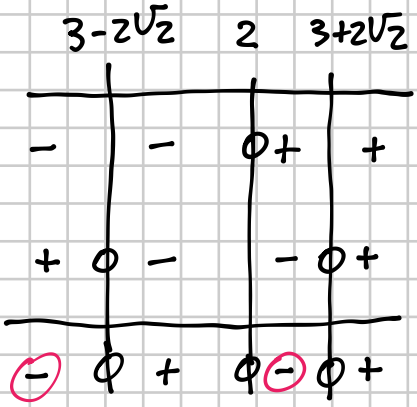
$(x-2)(x^2 - 6x + 1) < 0$

① ②

① $x - 2 > 0 \quad x > 2$

② $x^2 - 6x + 1 > 0 \qquad x < 3 - 2\sqrt{2} \vee x > 3 + 2\sqrt{2}$

$x_{1,2} = 3 \pm \sqrt{8} = 3 \pm 2\sqrt{2}$



$\boxed{x < 3 - 2\sqrt{2} \vee 2 < x < 3 + 2\sqrt{2}}$

2] SCOMPOSIZIONE ALTERNATIVA:

$(x-2)^3 - (2x^2 - x - 6) < 0$ $\quad S = -1 \quad P = -12 \hookrightarrow -4, +3$

$(x-2)^3 - (2x^2 - 4x + 3x - 6) < 0$

$(x-2)^3 - (2x(x-2) + 3(x-2)) < 0$

$(x-2)^3 - (x-2)(2x+3) < 0$

$(x-2)[(x-2)^2 - (2x+3)] < 0$ .....

432 $\dfrac{x}{x^2-1} - \dfrac{7}{3x+6} > \dfrac{1}{x^2+3x+2}$

$(x-1)(x+1) \quad 3(x+2) \quad (x+1)(x+2)$

$$\frac{x}{(x-1)(x+1)} - \frac{7}{3(x+2)} - \frac{1}{(x+1)(x+2)} > 0$$

$$\frac{3x(x+2) - 7(x-1)(x+1) - 3(x-1)}{3(x-1)(x+1)(x+2)} > 0$$

$$\frac{3x^2+6x-7(x^2-1)-3x+3}{(x-1)(x+1)(x+2)} > 0$$

$$\frac{3x^2+6x-7x^2+7-3x+3}{(x-1)(x+1)(x+2)} > 0$$

$$\frac{-4x^2+3x+10}{(x-1)(x+1)(x+2)} > 0$$

N_1 $\quad \dfrac{4x^2-3x-10}{(x-1)(x+1)(x+2)} < 0$

$D_1 \quad D_2 \quad D_3$

N_1 $\quad 4x^2-3x-10 > 0 \qquad \Delta = 9+160 = 169 = 13^2$

$$x_{1,2} = \frac{3 \pm 13}{8} = \begin{cases} -\frac{10}{8} = -\frac{5}{4} \\ \frac{16}{8} = 2 \end{cases}$$

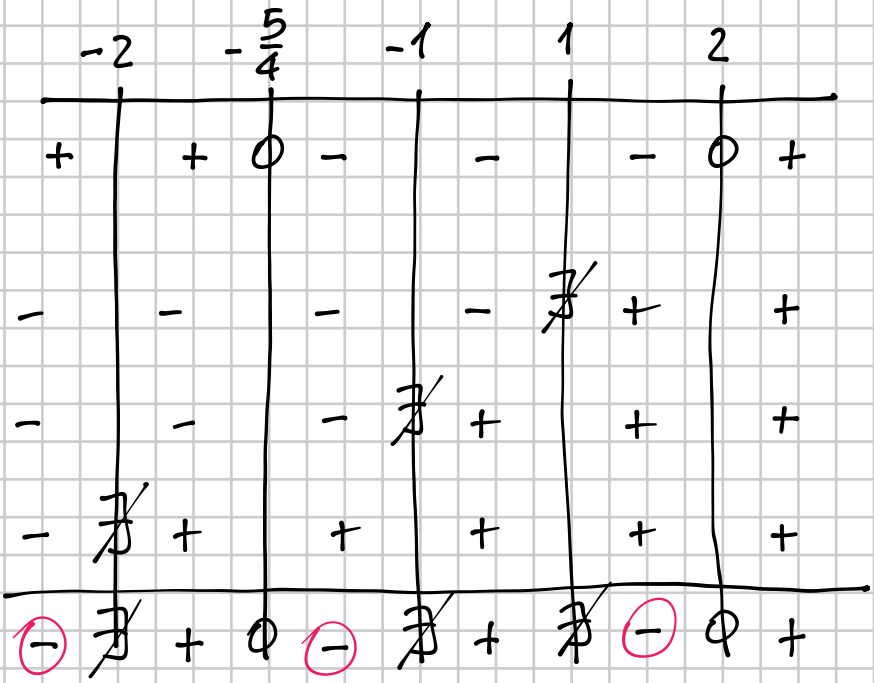
$x < -\frac{5}{4} \ \vee \ x > 2$

N_1] $x < -\frac{5}{4} \vee x > 2$

D_1] $x - 1 > 0 \quad x > 1$

D_2] $x + 1 > 0 \quad x > -1$

D_3] $x + 2 > 0 \quad x > -2$



$$x < -2 \vee -\frac{5}{4} < x < -1 \vee 1 < x < 2$$

482

$$\begin{cases} \text{(1)} \ \dfrac{x - x^2 - 3}{2x^2 - 5x} \geq 0 \\ \text{(2)} \ x^2 + 7x - 8 \geq 0 \end{cases}$$

$$\left[1 \leq x < \frac{5}{2}\right]$$

(1) $\dfrac{N}{D} \quad \dfrac{x - x^2 - 3}{2x^2 - 5x} \geq 0$

N] $-x^2 + x - 3 > 0 \qquad x^2 - x + 3 < 0 \qquad \Delta < 0$

IMPOSSIBILE, cioè il polinomio $x^2 - x + 3$ è sempre > 0

dunque $-x^2 + x - 3$ è sempre < 0

D] $2x^2 - 5x > 0$

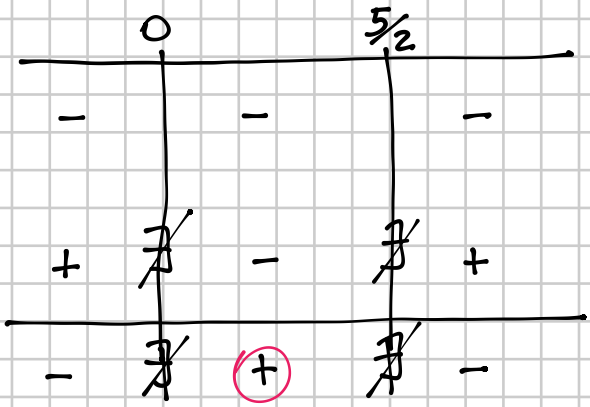
$x(2x - 5) > 0$

$x_1 = 0 \quad x_2 = \frac{5}{2}$

$x < 0 \vee x > \frac{5}{2}$

N] sempre < 0

D] $x < 0 \quad \vee \quad x > \frac{5}{2}$



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

(2) $x^2 + 7x - 8 \geq 0$

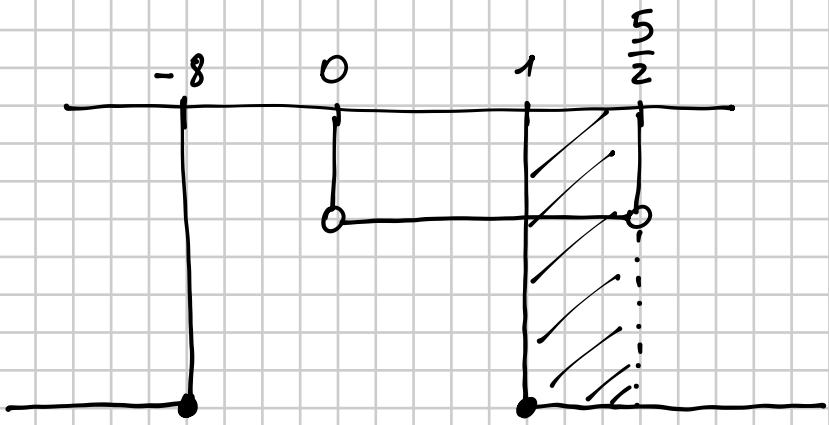
$(x+8)(x-1) \geq 0$

$x_1 = -8 \quad x_2 = 1$

$x \leq -8 \quad \vee \quad x \geq 1$

SISTEMA

$$\begin{cases} 0 < x < \frac{5}{2} \\ x \leq -8 \quad \vee \quad x \geq 1 \end{cases}$$



$$1 \leq x < \frac{5}{2}$$