ES.1) $\sqrt{11}>3 \Rightarrow \sqrt{11}-\frac{1}{4}>0$

perchè $\sqrt{11}>\sqrt{9}>3$

$\Rightarrow \sqrt{11}-\frac{1}{4}>3-\frac{1}{4}>0$

I numeri <0 sono : $-4 \quad -\frac{20}{11} \quad -1 \quad -\frac{15}{8}$

I numeri >0 sono : $3 \quad \sqrt{11}-\frac{1}{4}$

$-2=-\frac{16}{8} \quad -1=-\frac{8}{8}$

$-2=-\frac{22}{11} \quad -1=-\frac{11}{11}$

$-\frac{20}{11}$ e $-\frac{15}{8} \in]-2,-1[\Rightarrow$ dobbiamo confrontarli

$\boxed{-\frac{20}{11} \overset{?}{<} -\frac{15}{8}} \Leftrightarrow \frac{20}{11}>\frac{15}{8} \Leftrightarrow 8\cdot 20>15\cdot 11 \quad 160>161$ Falso

$\Rightarrow \boxed{-\frac{15}{8}<-\frac{20}{11}}$ Vera

Ora confrontiamo 3 e $\sqrt{11}-\frac{1}{4}$: $\boxed{3 \overset{?}{<} \sqrt{11}-\frac{1}{4}} \Leftrightarrow$

$\Leftrightarrow 12<4\sqrt{11}-1 \Leftrightarrow 13<4\sqrt{11} \Leftrightarrow 169<16\cdot 11=176$ Vero

essendo entrambi >0 posso $(\cdot)^2$

$\Rightarrow \boxed{3<\sqrt{11}-\frac{1}{4}}$ vera.

Quindi l'ordinamento richiesto è

$$-4 \quad -\frac{15}{8} \quad -\frac{20}{11} \quad -1 \quad 3 \quad \sqrt{11}-\frac{1}{4}.$$

ES.2)

potenza dispari

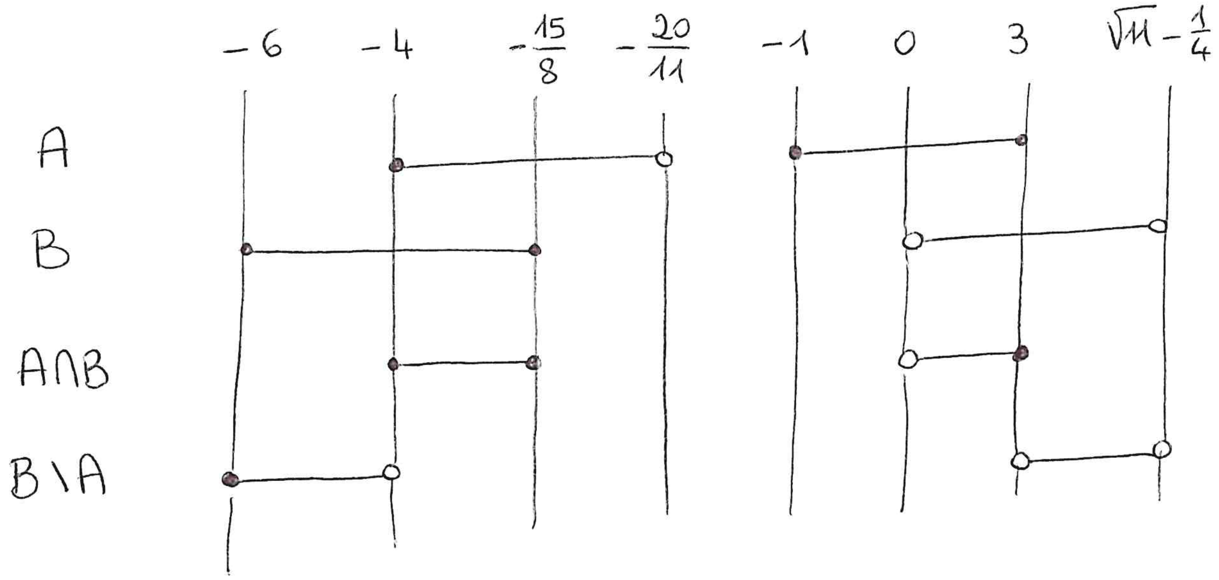
$$\frac{(-3)^3\left(\frac{1}{3}\right)^{-2}}{54}+\frac{\sqrt{40}}{\sqrt{45}}\cdot\sqrt{8}=\frac{-\cancel{3^3}\cdot 3^2}{2\cdot\cancel{3^3}}+\frac{\cancel{\sqrt{5}}\cdot\sqrt{8}}{\cancel{\sqrt{5}}\cdot 3}\sqrt{8}=$$

$40=5\cdot 2^3$

$45=3^2\cdot 5$

$$=-\frac{3^2}{2}+\frac{8}{3}=-\frac{9}{2}+\frac{8}{3}=\frac{-27+16}{6}=\boxed{-\frac{11}{6}}$$

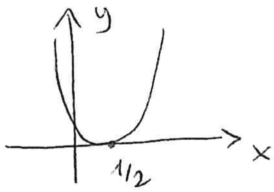
ES.3) Utilizzando l'ordinamento dell'es 1) abbiamo:



da cui $A \cap B = [-4, -\frac{15}{8}] \cup]0, 3]$

e $B \setminus A = [-6, -4[\cup]3, \sqrt{11} - \frac{1}{4}[$.

ES.4) $3x^2 - 3x + \frac{3}{4} > 0$ eq.^{ne} $3x^2 - 3x + \frac{3}{4} = 0$ $x_{1,2} = \frac{3 \pm \sqrt{9-9}}{6} = \frac{1}{2}$



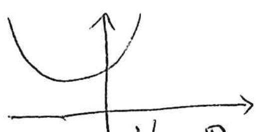
S $\forall x \neq \frac{1}{2}$ oppure $x \in]-\infty, \frac{1}{2}[\cup]\frac{1}{2}, +\infty[$.

ES.5) E' UN SISTEMA: risolviamo ogni disequazione e poi considereremo

$S = S_1 \cap S_2 \cap S_3$

1ª diseq.^{ne} $x^2 + x + \frac{1}{2} > 0$ eq.^{ne} $x^2 + x + \frac{1}{2} = 0$ $x_{1,2} = \frac{-1 \pm \sqrt{1-2}}{2}$ $\Delta < 0$

non esistono sol.^{ni} reali

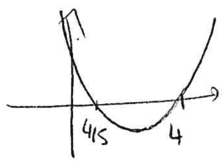


$\boxed{S_1 = \mathbb{R}}$

2ª diseq.^{ne} $\frac{x^2-1}{3} - \frac{2+x^2}{2} + (x-2)^2 < 0$ $2(x^2-1) - 3(2+x^2) + 6(x^2-4x+4) < 0$

$5x^2 - 24x + 16 < 0$ eq.^{ne} $5x^2 - 24x + 16 = 0$ $x_{1,2} = \frac{12 \pm \sqrt{144-80}}{5} =$

$= \frac{12 \pm \sqrt{64}}{5} = \frac{12 \pm 8}{5}$ $\nearrow 4/5$, $\searrow 4$



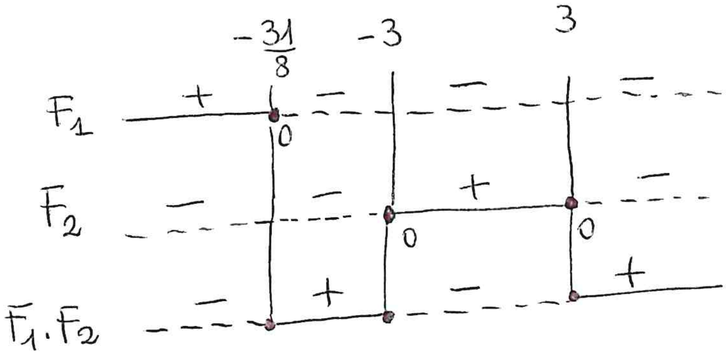
$\boxed{S_2 =]\frac{4}{5}, 4[}$

3ª disequazione è una disequazione <u>PRODOTTO</u>

$F_1 = 2(x-1) - 10(x+1) - 19 \geq 0$

$-8x - 31 \geq 0$

$8x \leq -31 \quad x \leq -\frac{31}{8}$



$F_2 = 3 - \frac{1}{3}x^2 \geq 0 \quad x^2 \leq 9$

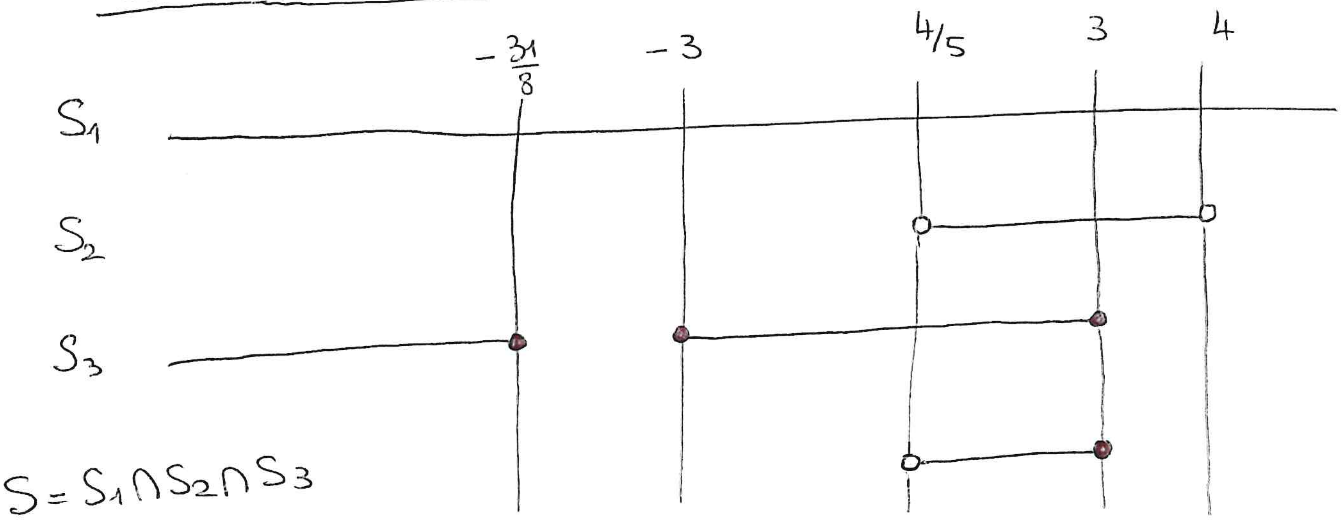
$-3 \leq x \leq 3$

$-\frac{31}{8} < -3 \iff \frac{31}{8} > 3 \iff 31 > 24$
V

$F_1 \cdot F_2 \leq 0 \iff x \in \left]-\infty, -\frac{31}{8}\right] \cup [-3, 3]$

$S_3 = \left]-\infty, -\frac{31}{8}\right] \cup [-3, 3]$

<u>Sol.ne del SISTEMA</u>



$S_{SISTEMA} = \left]\frac{4}{5}, 3\right]$

ES.6) $r_1: \quad 4y = 3x - 5 \quad y = \frac{3}{4}x - \frac{5}{4}$ coeff. angolare $m = \frac{3}{4}$

$P_0 = (-1, 2) \quad y = y_0 + m(x - x_0)$

$r_2: \quad m_{r_2} = m_{r_1} = \frac{3}{4} \quad y = 2 + \frac{3}{4}(x+1) \quad y = \frac{3}{4}x + \frac{11}{4}$

$r_3: \ 5x + y - 16 = 0$

$r_1 \cap r_3 \quad \begin{cases} 3x - 4y - 5 = 0 \\ 5x + y - 16 = 0 \end{cases}$ molt. 2ª eq.ne per 4 $\begin{cases} 3x - 4y - 5 = 0 \\ 20x + 4y - 64 = 0 \end{cases}$

$\begin{cases} \dots \\ 1^a + 2^a \quad 23x - 69 = 0 \end{cases} \quad \begin{cases} y = \frac{3}{4}x - \frac{5}{4} \\ x = \frac{69}{23} = 3 \end{cases} \quad \begin{cases} y = \frac{9}{4} - \frac{5}{4} = 1 \\ x = 3 \end{cases}$

$r_1 \cap r_3 \rightarrow P_1 = (3, 1)$.

Test 2019/19
Sol.ne 4