ESERCIZIO 1

$$\begin{cases} 9-2x > 3x-1 \\ x-2 > 7+4x \end{cases}$$

(A) $9-2x > 3x-1$

$-2x-3x > -1-9$

$-5x > -10$

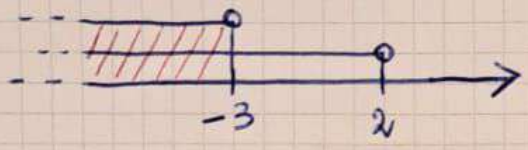
$x < 2$

(B) $x-2 > 7+4x$

$x-4x > 7+2$

$-3x > 9$

$x < -3$



$x < -3$

ESERCIZIO 2

$$\begin{cases} (x+4)(x-3) \leq -2+(x-3)(x+3) \\ 6(2x-3)-2(x+1) < 3(5x-6) \end{cases}$$

(A) $(x+4)(x-3) \leq -2+(x-3)(x+3)$

$x^2-3x+4x-12 \leq -2+x^2-9$

$x^2-3x+4x-x^2 \leq -2-9+12$

$x \leq 1$

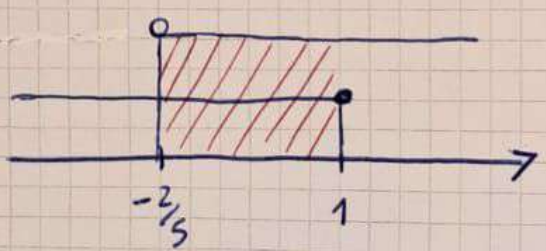
(B) $6(2x-3)-2(x+1) < 3(5x-6)$

$12x-18-2x-2 < 15x-18$

$12x-2x-15x < -18+18+2$

$-5x < +2$

$x > -\frac{2}{5}$



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

ESERCIZIO 3

$$\text{Ⓐ } \frac{2x-9}{3} \geq 4x - \frac{4}{3}$$
$$\text{Ⓑ } (x-1)^2 < x(x-3)$$

Ⓐ $\frac{2x-9}{3} \geq 4x - \frac{4}{3}$

$\frac{2x-9}{3} \geq \frac{12x-4}{3}$

$2x-9 \geq 12x-4$

$2x-12x \geq -4+9$

$-10x \geq 5$

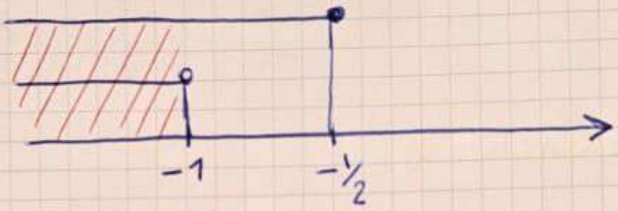
$x \leq -\frac{1}{2}$

Ⓑ $(x-1)^2 < x(x-3)$

$x^2-2x+1 < x^2-3x$

$x^2-x^2-2x+3x < -1$

$x < -1$



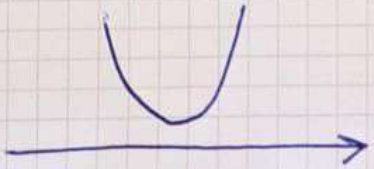
$x < -1$

ESERCIZIO 4

$$\text{Ⓐ } x^2+x+3 > 0$$
$$\text{Ⓑ } x^2-2x > 0$$

Ⓐ $x^2+x+3>0$

$\Delta = b^2-4ac = 1-4(1)(3) = -11 < 0$



$\mathbb{R}$

Ⓑ $x^2-2x>0$

$x(x-2)>0$

$x>0$

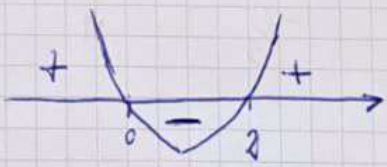
$x-2>0 \quad x>2$

	0		2	
$x>0$	−	+		+
$x>2$	−		−	+
	+	−	0	+

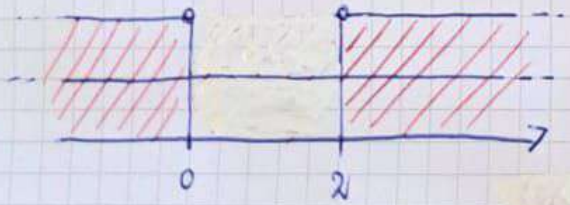
oppure

$\Delta = 4-4(1)(0) = 4$

$x_{1,2} = \frac{2 \pm \sqrt{4}}{2} \rightarrow x_1 = 2$, $x_2 = 0$



SOLUZIONE: $x<0 \cup x>2$



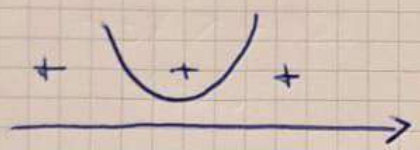
$x<0 \cup x>2$

ESERCIZIO 5

$$\begin{cases} \text{(A)}\ 3x^2-x+5<0 \\ \text{(B)}\ \dfrac{x+2}{3} > x+\dfrac{x-1}{4} \end{cases}$$

(A) $3x^2-x+5<0$

$\Delta = b^2-4ac = 1$



$\nexists x \in \mathbb{R}$

(B) $\dfrac{x+2}{3} > x+\dfrac{x-1}{4}$

$\dfrac{4x+8}{12} > \dfrac{12x+3x-3}{12}$

$4x+8 > 12x+3x-3$

$4x-12x-3x > -3-8$

$-11x > -11$

$x < 1$

SOLUZIONE:

⟶ LA DISEQUAZIONE (A) NON È MAI VERIFICATA, QUINDI L'INTERO SISTEMA NON È MAI VERIFICATO PERCHÈ NON CI SONO SOLUZIONI TALI DA SODDISFARE ENTRAMBE LE DISEQUAZ. IL SISTEMA SI DICE IMPOSSIBILE $\emptyset$

ESERCIZIO 6

$$\begin{cases} \text{(A)}\ 4-x^2 \geq 0 \\ \text{(B)}\ 2x-3>0 \\ \text{(C)}\ 3x^2-5x-2 \leq 0 \end{cases}$$

(B) $2x-3>0$

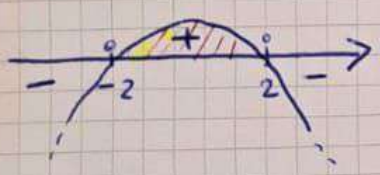
$2x>3$

$x > \dfrac{3}{2}$

(A) $4-x^2 \geq 0$

$\Delta = 0-4(-1)(4) = 16$

$x_{1,2} = \dfrac{-0 \pm \sqrt{16}}{2(-1)} = \dfrac{-0 \pm 4}{-2}$ → $x_1 = -2$, $x_2 = +2$

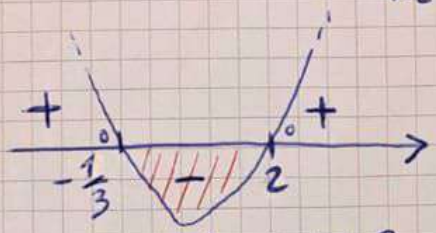


$-2 \leq x \leq 2$

(B) $3x^2-5x-2 \leq 0$

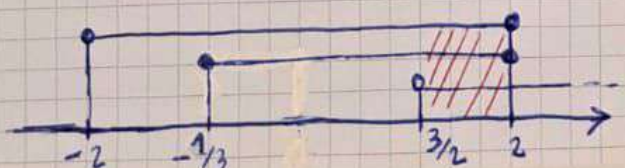
$\Delta = 25-4(3)(-2) = 49$

$x_{1,2} = \dfrac{5 \pm \sqrt{49}}{2(3)} = \dfrac{5 \pm 7}{6}$ → $x_1 = 2$, $x_2 = -\dfrac{1}{3}$



$-\dfrac{1}{3} \leq x \leq 2$

SOLUZIONE:



$\dfrac{3}{2} < x \leq 2$

ESERCIZIO 7

$$\begin{cases} \text{(A)}\ X \geq 5 \\ \text{(B)}\ X \leq 10 \\ \text{(C)}\ 15X \leq 120 \end{cases}$$

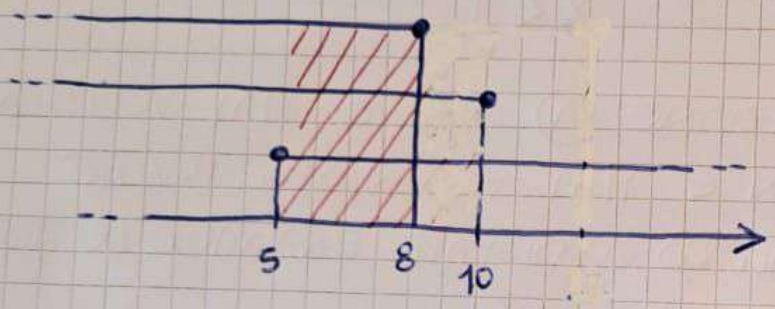
(A) $X \geq 5$

(B) $X \leq 10$

(C) $15X \leq 120$

$X \leq 8$

SOLUZIONE:



$5 \leq X \leq 8$