

## Inecuatii Rezolvati in $\mathbb{R}$ :

$$\begin{array}{c} 2x - 6 \\ \hline 5 - x \end{array} > 0$$

$\hookrightarrow E(x)$

$$\left\{ \begin{array}{l} 2x - 6 = 0 \Leftrightarrow \\ 2x = 6 \Leftrightarrow \\ x = 3 \end{array} \right\} \left\{ \begin{array}{l} 5 - x = 0 \Leftrightarrow \\ 5 = x \Rightarrow x = 5 \end{array} \right\}$$

| x        | - $\infty$ | 0  | 3  | 5  | + $\infty$ |
|----------|------------|----|----|----|------------|
| $2x - 6$ | ---        | +  | ++ | ++ | ++         |
| $5 - x$  | ++         | ++ | ++ | 0  | --         |
| $E(x)$   | ---        | 0  | ++ | -- | --         |

$$S = [3; 5)$$

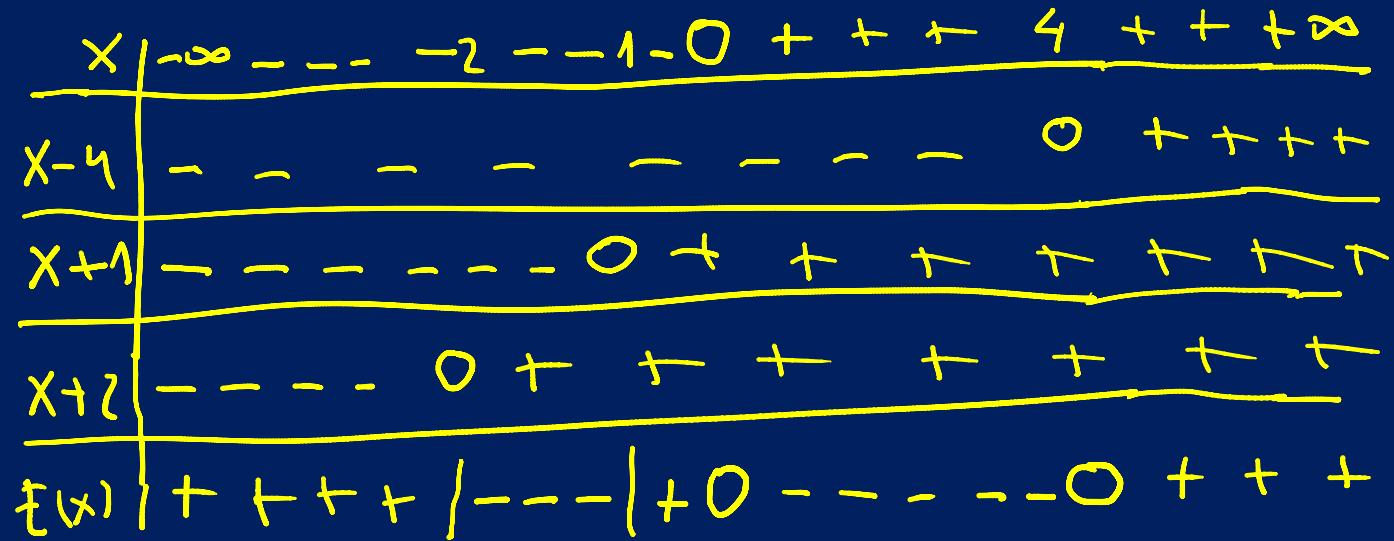
$$\frac{x^2 - 4x}{x^2 + 3x + 2} < 0$$

$\hookrightarrow E(x)$

$$\frac{x \cdot (x-4)}{(x+1)(x+2)} < 0$$

↑↓

$$\left\{ \begin{array}{l} x^2 - 4x = 0 \Leftrightarrow \\ x \cdot (x-4) = 0 \Leftrightarrow \\ x=0 \quad S \text{ sau } x-4=0 \Leftrightarrow \\ x=4 \\ \\ x^2 + 3x + 2 = 0 \Leftrightarrow \\ x^2 + 1 \cdot x + 2x + 1 \cdot 2 = 0 \Leftrightarrow \\ x(x+1) + 2(x+1) = 0 \Leftrightarrow \\ (x+1)(x+2) = 0 \Leftrightarrow \\ \\ x+1=0 \quad S \text{ sau } x+2=0 \\ x=-1 \quad \quad \quad x=-2 \end{array} \right.$$



$$S = (-2; -1) \cup (0; 4)$$

$$(1) \frac{x+5}{-2x-10} \geq 0$$

$$(2) \frac{x+5}{-2x-10} < 0$$

$$(1) \Leftrightarrow \frac{1}{-2 \cdot (x+5)} \geq 0 \quad \text{Punzen cond. } x+5 \neq 0 \\ x \neq -5 \\ x \in \mathbb{R} \setminus \{-5\}$$

$$(1) \Rightarrow -\frac{1}{z} \geq 0 \text{ (FA)(S)} \Rightarrow S = \emptyset$$

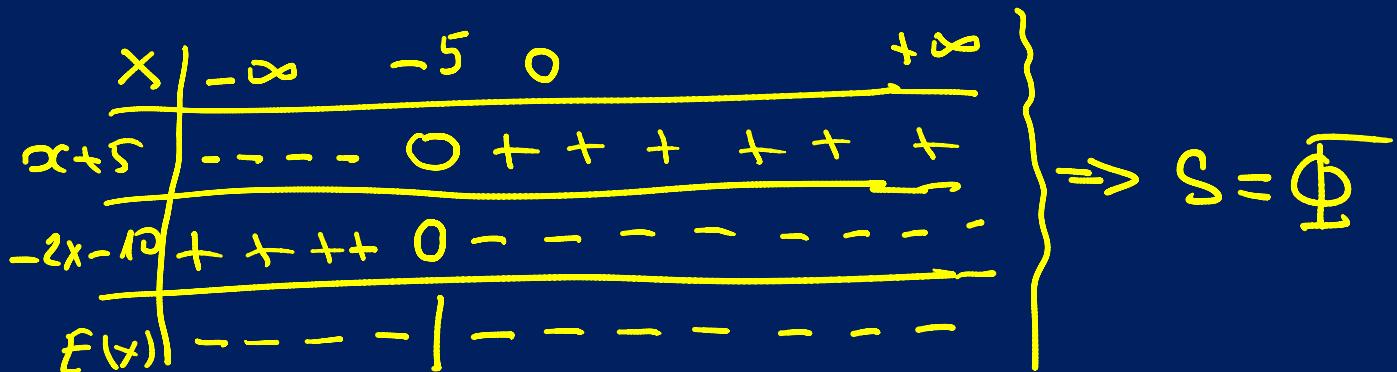
$$(2) \Leftrightarrow \frac{xc+5}{-2(xc+5)} < 0 \Rightarrow -\frac{1}{2} < 0 \text{ (A)}$$

(4)  $x \in \mathbb{R} \setminus \{-5\}$

$$\frac{x+5}{-2x-10} \geq 0$$

$$x + 5 = 0 \Leftrightarrow x = -5$$

$$\begin{aligned} -2x - 10 &= 0 \Leftrightarrow -2x = 10 \Leftrightarrow x = -\frac{10}{-2} \\ &\Leftrightarrow x = -5 \end{aligned}$$



$$\frac{x^2 + 6x + 9}{x^2 - 3} \geq 0 \quad (\text{A})$$

$$\begin{aligned}
 x^2 + 6x + 9 &= \underbrace{x^2 + 3x}_{} + \underbrace{3x + 9} = \\
 &= x(x+3) + 3(x+3) = (x+3)(x+3) \\
 x^2 + 6x + 9 &= x^2 + 2 \cdot 3x + 3^2 = (x+3)^2 \\
 x^2 - 3 &= 0 \Leftrightarrow x^2 - (\sqrt{3})^2 = 0 \Leftrightarrow
 \end{aligned}$$

$$x^2 - 3 = 0 \Leftrightarrow$$

$$x^2 = 3 \Leftrightarrow$$

$$\sqrt{x^2} = \sqrt{3} \iff$$

$$|x| = \sqrt{3} \Rightarrow \begin{cases} x = \sqrt{3} \\ x = -\sqrt{3} \end{cases} \in \mathbb{A} \cup$$

$$(1) \Leftrightarrow \frac{(x+3)^2}{(x-\sqrt{3})(x+\sqrt{3})} \geq 0$$

|              |           |      |             |     |            |           |
|--------------|-----------|------|-------------|-----|------------|-----------|
| $x$          | $-\infty$ | $-3$ | $-\sqrt{3}$ | $0$ | $\sqrt{3}$ | $+\infty$ |
| $(x+3)^2$    | +++       | 0    | +++         | ++  | ++         | ++        |
| $x-\sqrt{3}$ | -         | -    | -           | -   | 0          | ++        |
| $x+\sqrt{3}$ | -         | -    | -           | 0   | ++         | ++        |
| $F(x)$       | ++        | 0    | ++          |     | ---        | ++        |

$$S = (-\infty, -\sqrt{3}) \cup (\sqrt{3}, +\infty)$$

$$\frac{(x+3)^2}{(x-\sqrt{3})(x+\sqrt{3})} > 0 \Rightarrow$$

$$S = (\sqrt{3}, +\infty) \cup \left[ (-\infty, -\sqrt{3}) \setminus \{-3\} \right]$$