

NR. REAL - aplicații

$$|x| = \begin{cases} x, & \text{dacă } x \geq 0 \\ -x, & \text{dacă } x \leq 0 \end{cases} \quad |-10| = -(-10) = 10$$

$$\underline{|x| = -x \Leftrightarrow x \leq 0 \Leftrightarrow x \in \mathbb{R} - \cup \{0\}}$$

$$|x| = -|x| \quad \left\{ \begin{array}{l} |3| = 3 \quad -|3| = -3 \Rightarrow |3| \neq -|3| \\ |-7| = 7 \quad -|-7| = -7 \Rightarrow |-7| \neq -|-7| \\ |0| = 0 \quad -|0| = -0 = 0 \Rightarrow |0| = -|0| \\ \boxed{x=0} \end{array} \right.$$

$$|x| < 0$$

Dacă $|x| \geq 0$, $\forall x \in \mathbb{R} \Rightarrow |x| < 0$ IMPOSSIBIL $\Rightarrow x \in \emptyset$

$$-|x| > 3 \quad | \cdot (-1) \Leftrightarrow |x| < -3 < 0 \quad \left| \begin{array}{l} |x| \geq 0, \forall x \in \mathbb{R} \\ \Rightarrow x \in \emptyset \end{array} \right.$$

$$\overbrace{-8 \quad -7 \quad 6 \quad 7 \quad 8 \dots}^{< 0}$$

$$|2x+3| < 7 \Leftrightarrow -7 < 2x+3 < 7 \quad | -3 \Leftrightarrow -7-3 < 2x+3-3 < 7-3 \Leftrightarrow -10 < 2x < 4 \quad | :2$$

$$\underline{-5 < x < 2 \Rightarrow x \in \mathbb{R} \text{ a.r.}} \quad -5 < x < 2$$

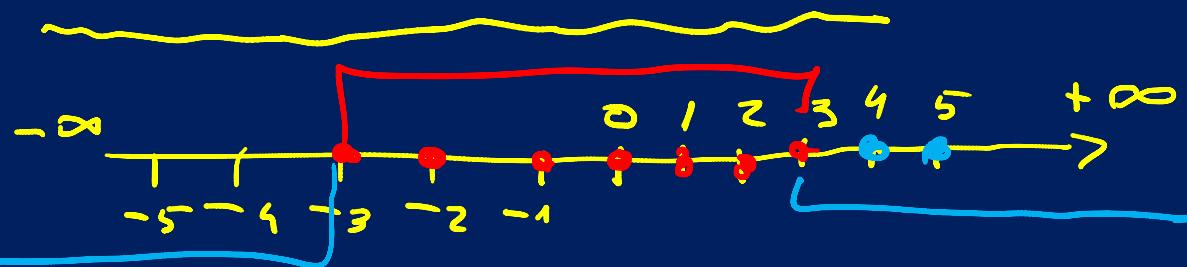
$$|-3x+1| < 4 \Leftrightarrow -4 < -3x+1 < 4 \quad | -1 \Leftrightarrow -5 < -3x < 3 \quad | \cdot \left(-\frac{1}{3}\right) \Leftrightarrow -3 \cdot \left(-\frac{1}{3}\right) = +\frac{5}{3} = \frac{5}{3} \Leftrightarrow \frac{5}{3} > x > -1 \Rightarrow x \in \mathbb{R} \text{ a.r.} \quad -1 < x < \frac{5}{3}$$

$$|4x - 5| < 11 \Leftrightarrow -11 < 4x - 5 < 11 \quad | +5 \Leftrightarrow$$

$$-11 + 5 < 4x - 5 + 5 < 11 + 5 \Leftrightarrow$$

$$-6 < 4x < 16 \quad | \cdot \frac{1}{4} \Leftrightarrow -\cancel{6} \cdot \frac{1}{4} < \cancel{4x} \cdot \frac{1}{4} < \cancel{16} \cdot \frac{1}{4} \Leftrightarrow$$

$$\Leftrightarrow -\frac{3}{2} < x < 4, x \in \mathbb{R}$$



$$|x| \leq 3 \Leftrightarrow -3 \leq x \leq 3$$

$$|x| \geq 3 \Leftrightarrow x \leq -3 \text{ OR } x \geq 3$$

$$|5x - 1| > 1 \Leftrightarrow 5x - 1 < -1 \text{ OR } 5x - 1 > 1$$

$$5x - 1 < -1 \Leftrightarrow 5x < -1 + 1 \Leftrightarrow 5x < 0 \Leftrightarrow x < \frac{0}{5}$$

$$\Leftrightarrow x < 0$$

$$5x - 1 > 1 \Leftrightarrow 5x > 1 + 1 \Leftrightarrow 5x > 2 \quad | \cdot \frac{1}{5} \Leftrightarrow$$

$$5x \cdot \frac{1}{5} > 2 \cdot \frac{1}{5} \Leftrightarrow x > \frac{2}{5}$$

$$\Rightarrow x \in \mathbb{R} \text{ a.s. } x < 0 \text{ OR } x > \frac{2}{5}$$

$$x \in \{y \mid y \in \mathbb{R}, y < 0\} \cup \{y \mid y \in \mathbb{R}, y > \frac{2}{5}\}$$

$$|-2x-3| \geq 5 \Leftrightarrow$$

$$-2x-3 \leq -5 \text{ or } -2x-3 \geq 5$$

$$-2x-3 \leq -5 \Leftrightarrow -2x \leq -5 + 3 \Leftrightarrow -2x \leq -2 \quad | :(-2)$$

$$x \geq 1$$

$$-2x-3 \geq 5 \Leftrightarrow -2x \geq 5 + 3 \Leftrightarrow -2x \geq 8 \quad | :(-2)$$

$$x \leq -4$$

$$x \in \mathbb{R} \text{ a.R. } x \leq -4 \text{ or } x \geq 1$$

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