Intervale : Scrieți sub formă de interval sau reuniuni de intervale:

$A = \{x \in \mathbb{R} \mid |-3x+2| < 5\}$

$-10 < -1 \quad |\cdot(-1)$
$10 > 1$

$|-3x+2| < 5 \iff -5 < -3x+2 < 5 \quad |-2 \iff$

$-5-2 < -3x+2-2 < 5-2 \iff$

$-7 < -3x < 3 \quad |\cdot\left(-\frac{1}{3}\right) \iff \frac{7}{3} > x > -1 \iff -1 < x < \frac{7}{3}$

$\Rightarrow A = \left(-1; \frac{7}{3}\right)$

$B = \{x \in \mathbb{R} \mid |2x-5| < 1\}$

$|2x-5| < 1 \iff -1 < 2x-5 < 1 \quad |+5 \iff$

$4 < 2x < 6 \quad |:2 \Rightarrow 2 < x < 3 \Rightarrow B = (2;3)$

$|x| > 3 \iff x < -3$ sau $x > 3 \iff$

$x \in (-\infty, -3)$ sau $x \in (3, +\infty) \Rightarrow x \in (-\infty, -3) \cup (3, +\infty)$

$|x-1| \geq 2 \iff x-1 \leq -2$ SAU $x-1 \geq 2$

$x-1 \leq -2 \iff$
$x \leq -2+1 \iff$
$x \leq -1 \iff$
$x \in (-\infty, -1]$

$x-1 \geq 2 \iff$
$x \geq 2+1 \iff$
$x \geq 3 \iff$
$x \in [3, +\infty)$

$x \in (-\infty, -1] \cup [3, +\infty)$

$|-x+1| \geq 0$ { $(\forall) x \in \mathbb{R} \Rightarrow |-x+1| \geq 0$ (A)

$|-x+1| \geq 0$ (A), $(\forall) x \in \mathbb{R}$

$A = \{x \in \mathbb{R} \mid |-x+1| \geq 0\} = (-\infty, \infty) = \mathbb{R}$

$|-2x+3| > 0$ { $B = \{x \in \mathbb{R} \mid |-2x+3| > 0\}$

$(\forall) x \in \mathbb{R} \Rightarrow |-2x+3| \geq 0$, dar $|-2x+3| > 0$

$\Rightarrow -2x+3 \neq 0 \Leftrightarrow -2x \neq -3 \mid :(-2)$

$|x-5| > -1$ $x \neq \frac{3}{2} \Rightarrow B = \mathbb{R} \setminus \{\frac{3}{2}\} = (-\infty, \infty) \setminus \{\frac{3}{2}\}$

$\rightarrow$ Stim că $(\forall) x \in \mathbb{R} \Rightarrow |x-5| \geq 0$

$0 > -1$ $\Rightarrow$

$\Rightarrow |x-5| > -1$, $(\forall) x \in \mathbb{R}$

$C = \{x \in \mathbb{R} \mid |x-5| > -1\} = (-\infty, \infty) = \mathbb{R}$

$|-2x+4| \geq 5 \Leftrightarrow -2x+4 \leq -5$ SAU $-2x+4 \geq 5$

$-2x+4 \leq -5 \mid -4 \Leftrightarrow$

$-2x \leq -9 \mid \cdot(-\frac{1}{2}) \Leftrightarrow$

$x \geq \frac{9}{2} \Rightarrow x \in [\frac{9}{2}, +\infty)$

$-2x+4 \geq 5 \mid -4 \Leftrightarrow$

$-2x+4-4 \geq 5-4 \Leftrightarrow$

$-2x \textcircled{\geq} 1 \mid \cdot(-\frac{1}{2}) \Leftrightarrow$

$-2x \cdot (-\frac{1}{2}) \textcircled{\leq} 1 \cdot (-\frac{1}{2}) \Leftrightarrow$

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

$x \in (-\infty, -\frac{1}{2}]$

$C = (-\infty, -\frac{1}{2}] \cup [\frac{9}{2}, +\infty)$

$D=\{x\in\mathbb{R} \mid |3x-4|\geq 5\}$ $E=\{x\in\mathbb{R} \mid |-x-1|>1\}$

$F=\{x\in\mathbb{R} \mid |2x+1|\geq 2\sqrt{3}-\sqrt{13}\}$

$|3x-4|\geq 5 \Leftrightarrow 3x-4\leq -5$ sau $3x-4\geq 5$

$3x-4\leq -5 \Leftrightarrow$
$3x\leq -5+4 \Leftrightarrow$
$3x\leq -1 \mid \cdot\frac{1}{3} \Leftrightarrow$
$3x\cdot\frac{1}{3}\leq -1\cdot\frac{1}{3} \Leftrightarrow$
$x\leq -\frac{1}{3} \Rightarrow x\in(-\infty,-\frac{1}{3}]$

$3x-4\geq 5 \Leftrightarrow$
$3x\geq 9 \mid :3 \Leftrightarrow$
$x\geq 3 \Leftrightarrow$
$x\in[3,+\infty)$

$D=(-\infty,-\frac{1}{3}]\cup[3,+\infty)$

$|-x-1|>1$

$|x|\cdot|y|=|x\cdot y| \quad \left|\frac{x}{y}\right|=\frac{|x|}{|y|},\ y\neq 0$

$|x+y|\leq|x|+|y|$

$|-x-1|=|(-1)\cdot(x+1)|=|-1|\cdot|x+1|=1\cdot|x+1|=|x+1|$

$|x+1|>1 \Leftrightarrow x+1<-1$ sau $x+1>1$

$x+1<-1 \mid -1 \Leftrightarrow$
$x<-2 \Leftrightarrow$
$x\in(-\infty,-2)$

$x+1>1 \mid -1 \Leftrightarrow$
$x>0 \Leftrightarrow$
$x\in(0,+\infty)$

$E=(-\infty,-2)\cup(0,+\infty)$

$$|2x+1| \geq 2\sqrt{3} - \sqrt{13}$$

$$2\sqrt{3} = \sqrt{4 \cdot 3} = \sqrt{12}$$

$$12 < 13 \Rightarrow \sqrt{12} < \sqrt{13} \Rightarrow 2\sqrt{3} < \sqrt{13} \Rightarrow 2\sqrt{3} - \sqrt{13} < 0 \Rightarrow$$

$$0 > 2\sqrt{3} - \sqrt{13}$$

$$|2x+1| \geq 0, \ (\forall) \ x \in \mathbb{R}$$

$$\Rightarrow |2x+1| > 2\sqrt{3} - \sqrt{13}$$

$$(A), \ (\forall) \ x \in \mathbb{R}$$

$$\Rightarrow F = (-\infty, +\infty) = \mathbb{R}$$

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