

MATH MORE EASY

INTERVALE ÎN R REPREZENTAREA PE AXĂ

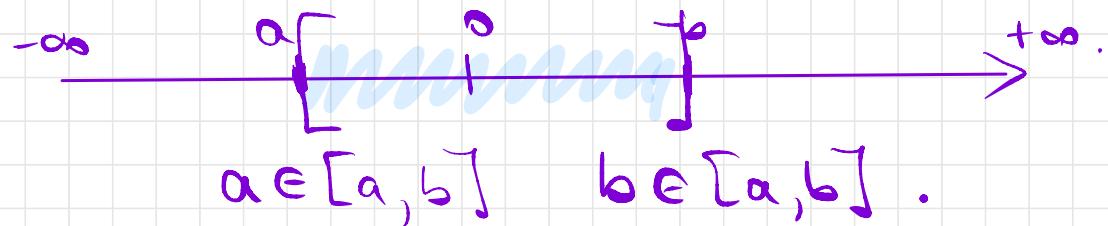
Clasa a VIII a

Intervale mărginite

Dacă avem două numere reale $a \leq b$ atunci :

Mulțimea $\{x \in \mathbb{R} \mid a \leq x \leq b\} = [a, b]$

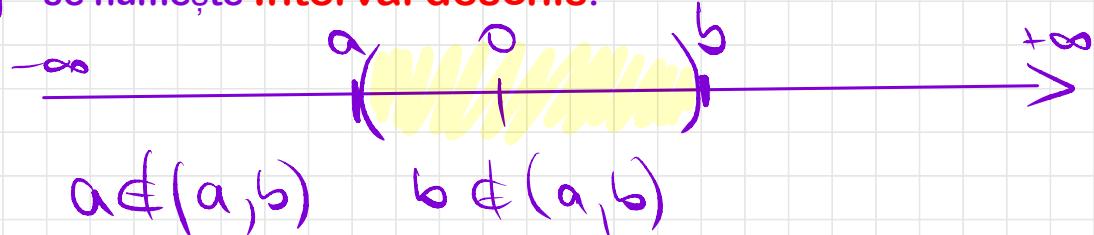
$[a, b]$ se numește **Interval închis**. Numerele a și b se numesc capetele intervalului.



Dacă avem două numere reale $a < b$ atunci :

Mulțimea $\{x \in \mathbb{R} \mid a < x < b\} = (a, b)$

(a, b) se numește **Interval deschis**.

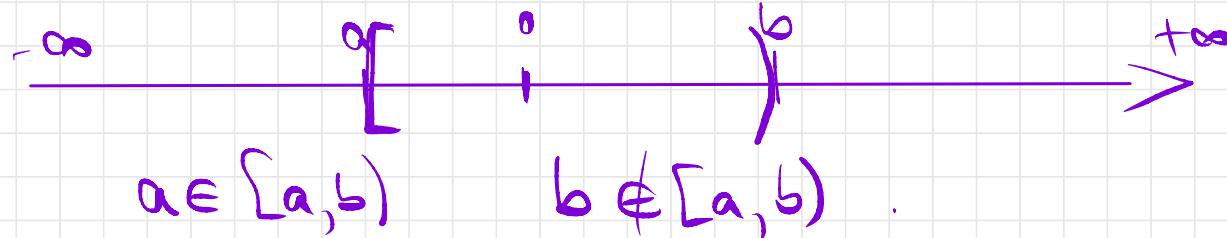


Pentru numerele reale $a < b$

Intervale care nu își conțin capetele:

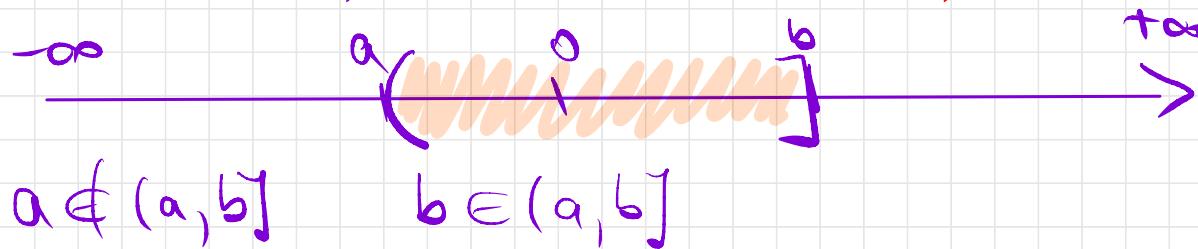
$\{x \in \mathbb{R} \mid a \leq x < b\} = [a, b)$

$[a, b)$ se numește **Interval închis în a și deschis în b.**



$\{x \in \mathbb{R} \mid a < x \leq b\} = (a, b]$

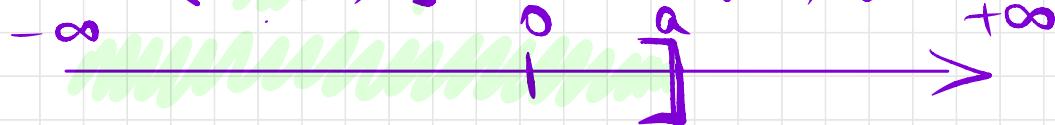
$(a, b]$ se numește **Interval deschis în a și închis în b.**



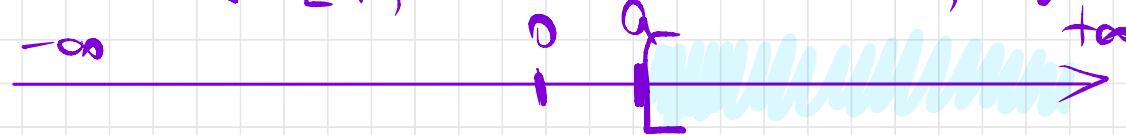
Intervale nemărginite

Putem avea și următoarele intervale pentru numarul real $a \in \mathbb{R}$

$$\{x \in \mathbb{R} \mid x \leq a\} = (-\infty; a]$$



$$\{x \in \mathbb{R} \mid x \geq a\} = [a, +\infty)$$



$$\{x \in \mathbb{R} \mid x < a\} = (-\infty, a)$$



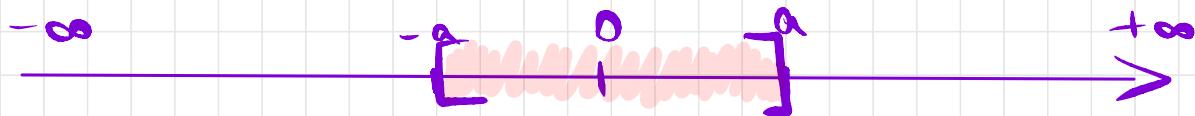
$$\{x \in \mathbb{R} \mid x > a\} = (a, +\infty)$$



Modulul unui număr

$$\{x \in \mathbb{R} \mid |x| \leq a\} = [-a, a]$$

$$|x| \leq a \Rightarrow -a \leq x \leq a$$



$$\{x \in \mathbb{R} \mid |x| \geq a\} = (-\infty; -a] \cup [a; +\infty)$$

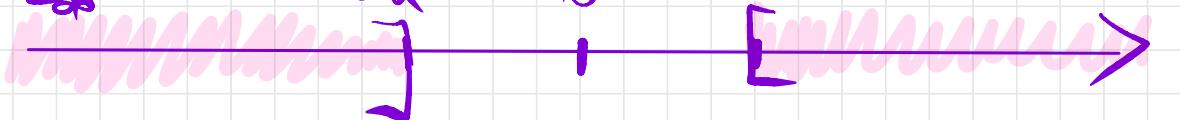
$$-x \geq a \quad | \cdot (-1)$$

$$x \geq a$$

$$x \leq -a$$

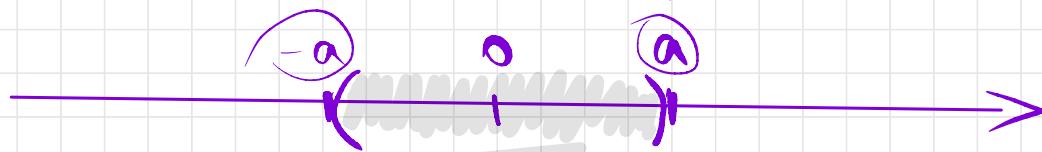
$$x \in [a; +\infty)$$

$$x \in (-\infty; -a]$$



$$\{x \in \mathbb{R} \mid |x| < a\} = (-a, a)$$

$$-a < x < a \Rightarrow x \in (-a, a)$$



$$\{x \in \mathbb{R} \mid |x| > a\} = (-\infty, -a) \cup (a, +\infty)$$

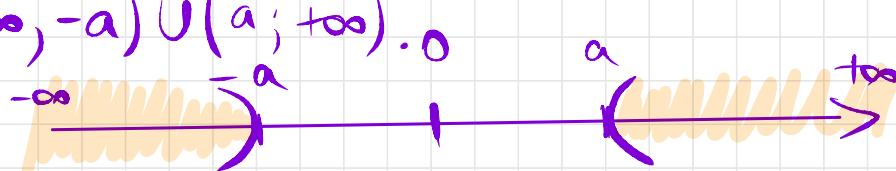
$$-x > a \cdot (-1)$$

$$x < -a$$

$$x \in (-\infty, -a)$$

$$x > a$$

$$x \in (a, +\infty)$$

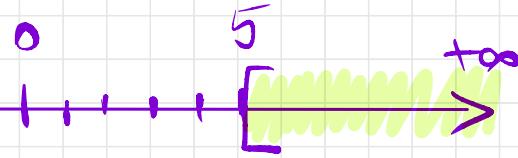


EXERCITII

Scrieti sub forma de interval următoarele multimi:

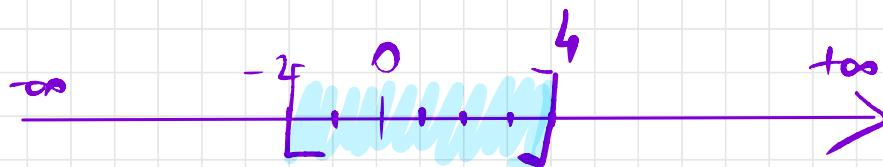
a) $A = \{x \in \mathbb{R} \mid x \geq 5\}$ $-\infty$

$$A = [5, +\infty)$$



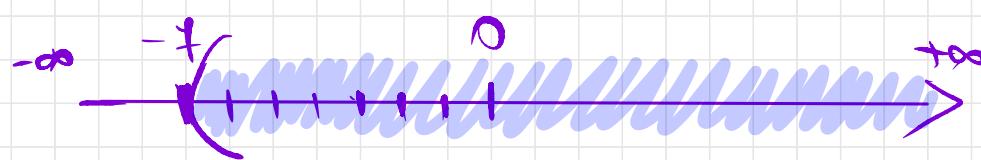
b) $B = \{x \in \mathbb{R} \mid -2 \leq x \leq 4\}$ $-\infty$

$$B = [-2, 4]$$



c) $C = \{x \in \mathbb{R} \mid -4 < x\}$

$$C = (-4; +\infty)$$



d) $D = \{x \in \mathbb{R} \mid -5 < 2x+1 \leq 7\} = (-3, 3]$

$$-5 < 2x+1 \leq 7$$

$$-6 < 2x \leq 6$$

$$-3 < x \leq 3$$



e)

$$E = \left\{ x \in \mathbb{R} \mid -9 \leq \frac{4x+6}{2} < 9 \right\} = [-6; 3]$$

$$-9 \leq \frac{4x+6}{2} < 9 \mid \cdot 2$$

$$-18 \leq 4x + 6 < 18 \mid -6$$

$$-24 \leq 4x < 12 \mid :4$$

$$-6 \leq x < 3$$



f)

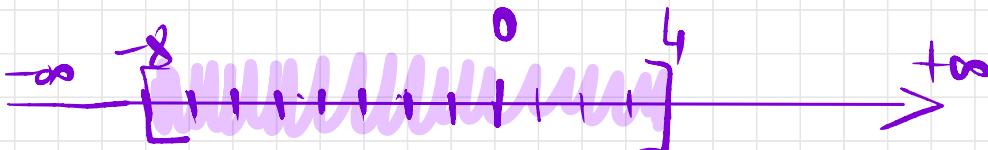
$$F = \left\{ x \in \mathbb{R} \mid |3x+6| \leq 18 \right\} = [-8, 4].$$

$$|3x+6| \leq 18$$

$$-18 \leq 3x+6 \leq 18 \mid -6$$

$$-24 \leq 3x \leq 12 \mid :3$$

$$-8 \leq x \leq 4$$



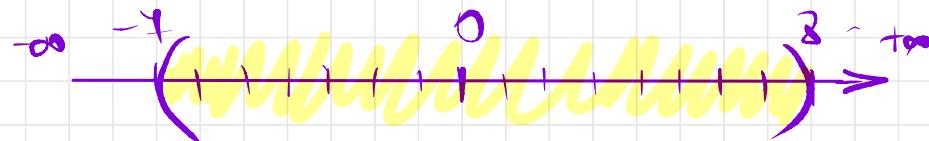
g) $G = \{x \in \mathbb{R} \mid |\frac{2x-1}{5}| < 3\} = (-4, 8)$.

$$-3 < \frac{2x-1}{5} < 3 \quad | \cdot 5$$

$$-15 < 2x - 1 < 15 \quad | +1$$

$$-14 < 2x < 16 \quad | :2$$

$$-7 < x < 8$$



h) $H = \{x \in \mathbb{R} \mid \sqrt{(2x+3)^2} \leq 7\} = [-5, 2]$

$$|2x+3| \leq 7$$

$$-7 \leq 2x+3 \leq 7 \quad | -3$$

$$-10 \leq 2x \leq 4 \quad | :2$$

$$-5 \leq x \leq 2$$





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