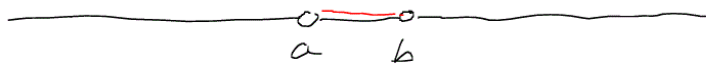
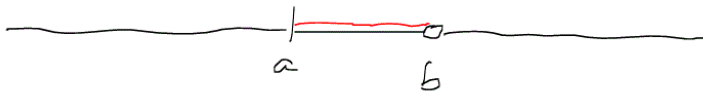


Intervals

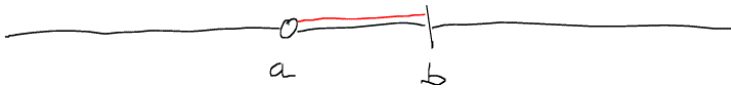
1) $(a, b) = \{x \in \mathbb{R} \mid a < x < b\}$ Interval obert



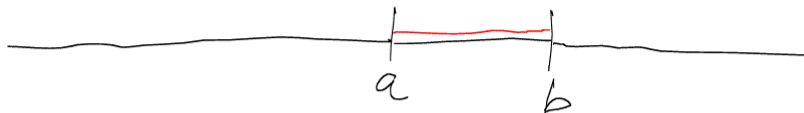
2) $[a, b) = \{x \in \mathbb{R} \mid a \leq x < b\}$ Interval semiobert



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



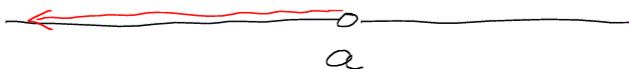
4) $[a, b] = \{x \in \mathbb{R} \mid a \leq x \leq b\}$ Interval tancat



5) $(a, +\infty) = \{x \in \mathbb{R} \mid a < x\}$ Intervals no fitats oberts



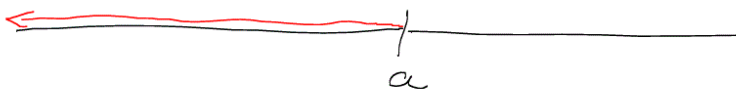
6) $(-\infty, a) = \{x \in \mathbb{R} \mid x < a\}$



7) $[a, +\infty) = \{x \in \mathbb{R} \mid a \leq x\}$ Intervals no fitats tancats



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

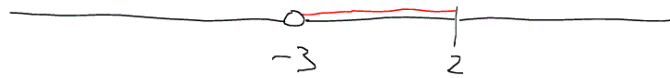


Exemples

$$1) \begin{cases} 2x - 4 \leq 0 \\ -3x - 9 < 0 \end{cases} \begin{cases} 2x \leq 4 \\ -3x < 9 \end{cases} \begin{cases} x \leq 4/2 \\ x > 9/-3 \end{cases} \begin{cases} x \leq 2 \\ x > -3 \end{cases}$$

Conjunt de solucions:

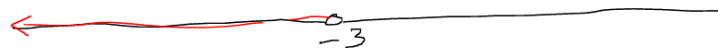
$$\{x \in \mathbb{R} \mid -3 < x \leq 2\} = (-3, 2]$$



$$2) \begin{cases} 2x - 9 < 0 \\ -3x - 6 > 0 \end{cases} \begin{cases} 2x < 9 \\ -3x > 6 \end{cases} \begin{cases} x < 9/2 \\ x < 6/-3 \end{cases} \begin{cases} x < 9/2 \\ x < -3 \end{cases} \Rightarrow \boxed{x < -3}$$

Conjunt de solucions:

$$\{x \in \mathbb{R} \mid x < -3\} = (-\infty, -3)$$



Notació Científica

$$45600000 = 4,56 \cdot 10^7$$

$$0,00000845 = 8,45 \cdot 10^{-6}$$

Suma

$$\begin{aligned} 2,4 \cdot 10^3 + 4,5 \cdot 10^5 - 2,3 \cdot 10^4 &= 2,4 \cdot 10^3 + 4,5 \cdot 10^2 \cdot 10^3 - 2,3 \cdot 10 \cdot 10^3 = \\ &= 2,4 \cdot 10^3 + 450 \cdot 10^3 - 230 \cdot 10^3 = (2,4 + 450 - 230) \cdot 10^3 = 222,4 \cdot 10^3 = \\ &= 2,224 \cdot 10^2 \cdot 10^3 = 2,224 \cdot 10^5 \end{aligned}$$

Producte i Divisió

$$\frac{4,5 \cdot 10^7 \cdot 2,1 \cdot 10^8}{9 \cdot 10^{-7}} = \frac{4,5 \cdot 2,1}{9} \cdot 10^{7+8-(-7)} = 1,05 \cdot 10^{22}$$

Exercici 39

$$-1 \leq 3x + 5$$

$$-1 - 5 \leq 3x$$

$$-6 \leq 3x$$

$$\frac{-6}{3} \leq x$$

$$-2 \leq x$$

$$3x + 5 < 2$$

$$3x < 2 - 5$$

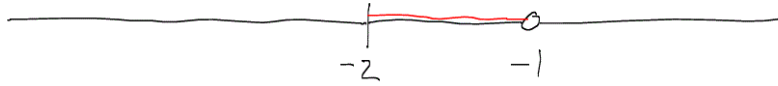
$$3x < -3$$

$$x < \frac{-3}{3}$$

$$x < -1$$

Conjunt de Solucions

$$\{x \in \mathbb{R} \mid -2 \leq x < -1\} = [-2, -1)$$



Exercici 40

$$\begin{aligned} \text{a)} \quad & 2,5 \cdot 10^4 + 10^5 - 6,25 \cdot 10^3 = 2,5 \cdot 10 \cdot 10^3 + 10^2 \cdot 10^3 - 6,25 \cdot 10^3 = \\ & = 25 \cdot 10^3 + 100 \cdot 10^3 - 6,25 \cdot 10^3 = (25 + 100 - 6,25) \cdot 10^3 = \\ & = 118,75 \cdot 10^3 = 1,1875 \cdot 10^2 \cdot 10^3 = 1,1875 \cdot 10^5 \end{aligned}$$

$$\begin{aligned} \text{b)} \quad & (10^6 : 4 \cdot 10^{-3}) : 5 \cdot 10^7 = (0,25 \cdot 10^{6-(-3)}) : 5 \cdot 10^7 = \\ & = 0,25 \cdot 10^9 : 5 \cdot 10^7 = 0,05 \cdot 10^{9-7} = 0,05 \cdot 10^2 = 5 \end{aligned}$$

$$\begin{aligned} \text{c)} \quad & \frac{1,25 \cdot 10^{12} - 10^{12}}{10^{10} + 5 \cdot 10^9} = \frac{(1,25 - 1) \cdot 10^{12}}{(10 + 5) \cdot 10^9} = \frac{0,25}{15} \cdot 10^{12-9} = \\ & = 0,0\overline{16} \cdot 10^3 = 1,6 \cdot 10^{-2} \cdot 10^3 = 1,6 \cdot 10^1 = 16,6 \end{aligned}$$

$$\begin{aligned} \text{d)} \quad & (10^4 - 10^7)^2 = ((1 - 10^3) \cdot 10^4)^2 = (-999 \cdot 10^4)^2 = \\ & = (-999)^2 \cdot 10^8 = 998001 \cdot 10^8 = 9,98001 \cdot 10^5 \cdot 10^8 = 9,98001 \cdot 10^{13} \end{aligned}$$