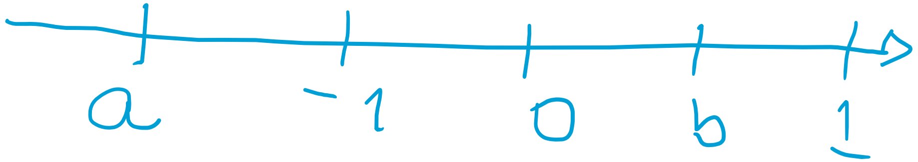
Pag 25

C7



$a < -1 < 0$

$0 < b < 1$

f) provar que $\frac{1}{b} > 1$ (V)

$0 < b$ e $b < 1$ $\qquad b < 1 \xrightarrow[\frac{1}{b} > 0]{\times \frac{1}{b}} b \cdot \frac{1}{b} < 1 \cdot \frac{1}{b} \Rightarrow 1 < \frac{1}{b}$ cqd

a) provar que $\frac{a}{b} < a$ (V)

$\frac{1}{b} > 1 \xrightarrow[a < 0]{\times a} a \cdot \frac{1}{b} < 1 \cdot a \Rightarrow \frac{a}{b} < a$ cqd

b) $b^2 > 1$ (F)

$b = \frac{1}{2} \qquad b^2 = \frac{1}{4}$

$0 < b < 1 \xrightarrow[b > 0]{\times b} 0 \cdot b < b \cdot b < 1 \cdot b$

$0 < b^2 < b < 1$

c) $-1 < a+b < 0$ (F) $\quad a < -1$ e $0 < b < 1$

$a = -10$ e $b = \frac{1}{100}$ $\qquad a + b = -10 + \frac{1}{100}$

$$a < -1 \xrightarrow{+b} a+b < \underbrace{-1+b}_{\text{entre } -1 \text{ e } 0} \quad \text{e} \quad 0<b<1$$

d) $b < a^2 < 1$ F

$a = -3 \Rightarrow a^2 = 9 > 1$

e) $b < b - a < 1$ F

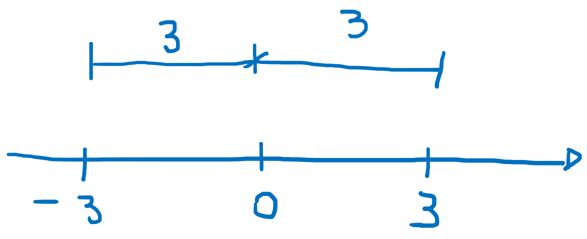
$a = -10$ e $b = \frac{1}{100}$ $\qquad b - a = \frac{1}{100} - (-10) = \frac{1}{100} + 10 > 1$

g) $a < \frac{1}{a} < -1$ F

$a = -2$ $\qquad \frac{1}{a} = \frac{1}{-2} = -\frac{1}{2} > -1$

Módulo

Ideia



posit

$|3| = 3$

$|0| = 0$

neg

$|-3| = 3 = -(-3)$

sou negativo

$|1-\sqrt{3}| = -(1-\sqrt{3}) = -1+\sqrt{3}$

$|\pi - 2| = \pi - 2$ $\qquad \pi > 3$, $\pi - 2 > 0$

sou positivo

$|\underbrace{\pi - 5}_{\text{neg}}| = -(\pi - 5) = -\pi + 5$

$$\boxed{\textbf{Def}\quad x \in \mathbb{R} \qquad |x| = \begin{cases} x, & \text{se } x \geq 0 \\ -x, & \text{se } x < 0 \end{cases}}$$

Propriedades

1. $|x| \geq 0, \forall x \in \mathbb{R}$
2. $|x \cdot y| = |x| \cdot |y|, \forall x, y \in \mathbb{R}$
3. $\boxed{\sqrt{x^2} = |x|, \forall x \in \mathbb{R}}$
4. $|x| = |-x|, \forall x$

$|2| = |-2|$

$|3| = |-3|$

$|\pi - 2| = |-\pi + 2|$

neg, não vale a propriedade de radiciação

$2 = \sqrt{4} = \sqrt[2]{(-2)^2} \neq -2$

$\sqrt[\cancel{6}\,2]{2^{\cancel{9}\,3}} = \sqrt[2]{2^3}$ pode fazer isso, pois 2 é positivo

$\sqrt{(-3)^2} = |-3| = 3$ $\quad (\sqrt{x})^2$ com $x \geq 0$ $\quad \sqrt{x^2}$

par

$\sqrt[2]{4}$ → este símbolo representa um único nº real que é positivo

nº positivo

$$\sqrt[2]{4} = 2$$

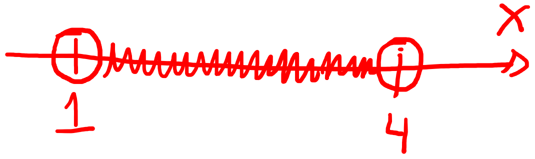
$$\sqrt[2]{9} = 3$$

$$\sqrt[2]{16} = 4$$

$$\sqrt[4]{16} = 2$$

Intervalos reais (subconj. de $\mathbb{R}$)

$\{x \in \mathbb{R} \mid 1 < x < 4\}$

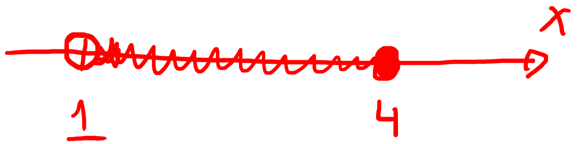


$]1;4[$ intervalo aberto

$\{x \in \mathbb{R} \mid 1 \leq x \leq 4\}$

$[1;4]$ intervalo fechado

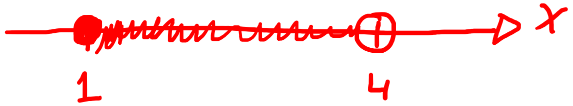
$\{x \in \mathbb{R} \mid 1 < x \leq 4\}$



$]1;4]$

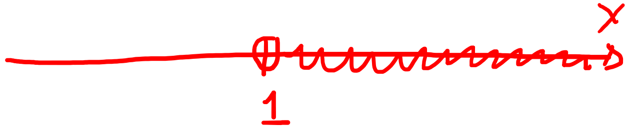
$]1,4]$

$\{x \in \mathbb{R} \mid 1 \leq x < 4\}$



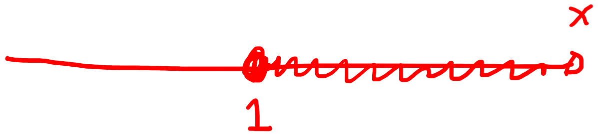
$[1;4[$

$\{x \in \mathbb{R} \mid x > 1\}$



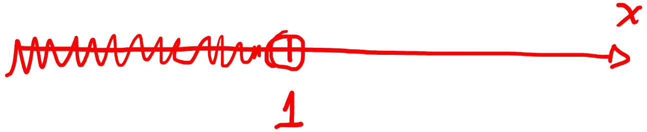
$]1; +\infty[$

$\{x \in \mathbb{R} \mid x \geq 1\}$



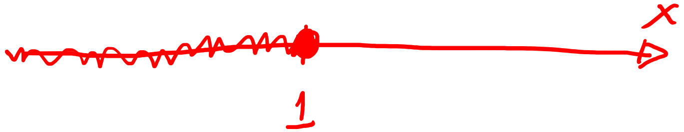
$[1; +\infty[$

$\{x \in \mathbb{R} \mid x < 1\}$



$]-\infty, 1[$

$\{x \in \mathbb{R} \mid x \leq 1\}$



$]-\infty, 1]$