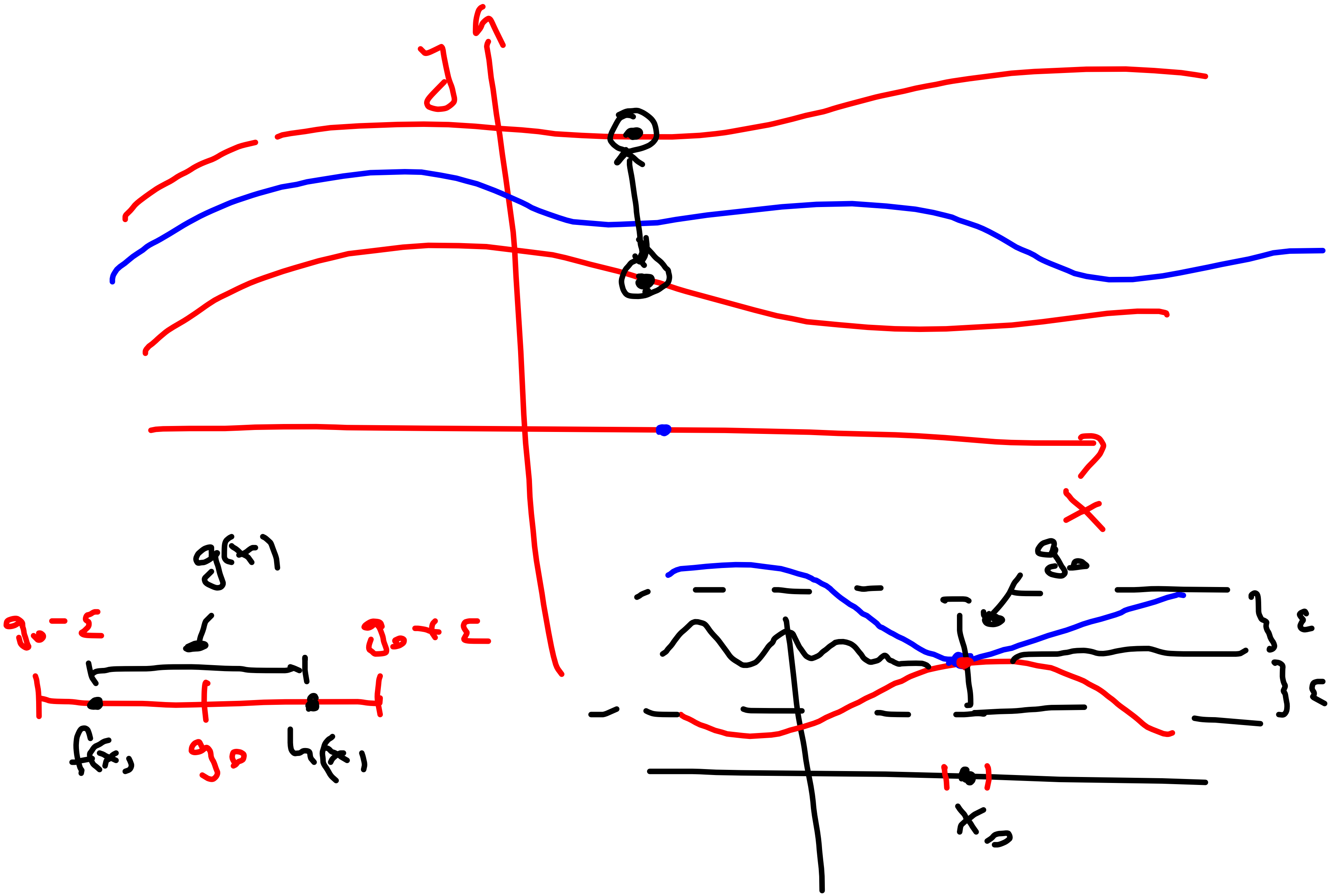
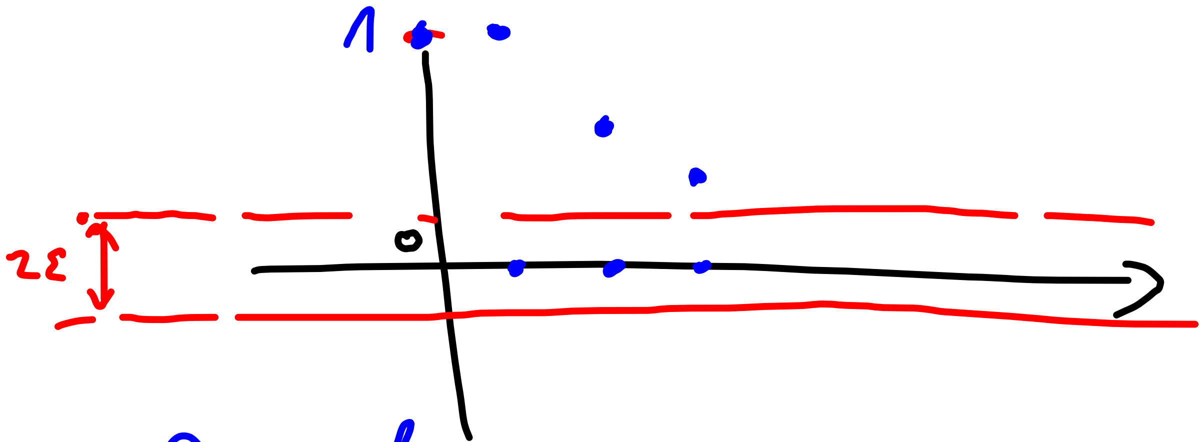

y
h
x
g(x)
g₀ − ε
g₀ + ε
f(x)
g₀
h(x)
g₀
ε
ε
x₀

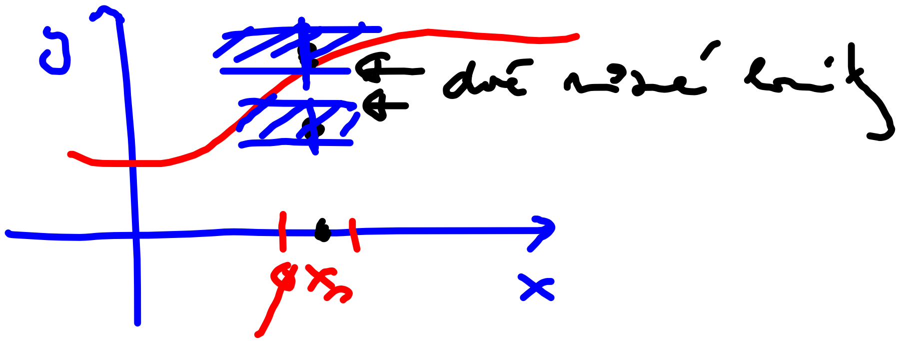
Příklad: $a_n = \frac{1}{n}$ $\lim\limits_{n\to\infty} a_n = 0$



$c_n = 0$ $\lim\limits_{n\to\infty} c_n = 0$

$\Rightarrow \lim\limits_{n\to\infty} \frac{1}{n^k} = 0 \quad \forall k \in \mathbb{N}\setminus\{0\}$

protože $0 \le \frac{1}{n^k} \le \frac{1}{n}$



← jednoznačnost

body pro které zároveň
f(x) patří do obou
DISJUNKTNÍCH pásů

---

pro $\varepsilon > 0$ ex. δ tž. $O_\delta(x_0)$, $x \in O_\delta(x_0)$

$|f(x) - a| < \varepsilon$ a zároveň $|g(x) - b| < \varepsilon$

$$|f(x) + g(x) - a - b| \le |f(x) - a| + |g(x) - b|$$

$$< \varepsilon + \varepsilon$$

$$\lim_{n\to\infty} \overbrace{\frac{3n+4}{n^2+n+5}}^{A} = \lim_{n\to\infty} \frac{3n}{n^2+n+5} + \lim_{n\to\infty} \frac{4}{n^2+n+5}$$

1)
$$= \frac{1}{\lim_{n\to\infty} \frac{n^2+n+5}{3n}} + \frac{1}{\lim_{n\to\infty} \frac{n^2+n+5}{4}} = 0 + 0 = 0$$

2)
$$0 \leq A \leq \frac{3n+4}{n^2} = \frac{3}{n} + \frac{4}{n^2}$$

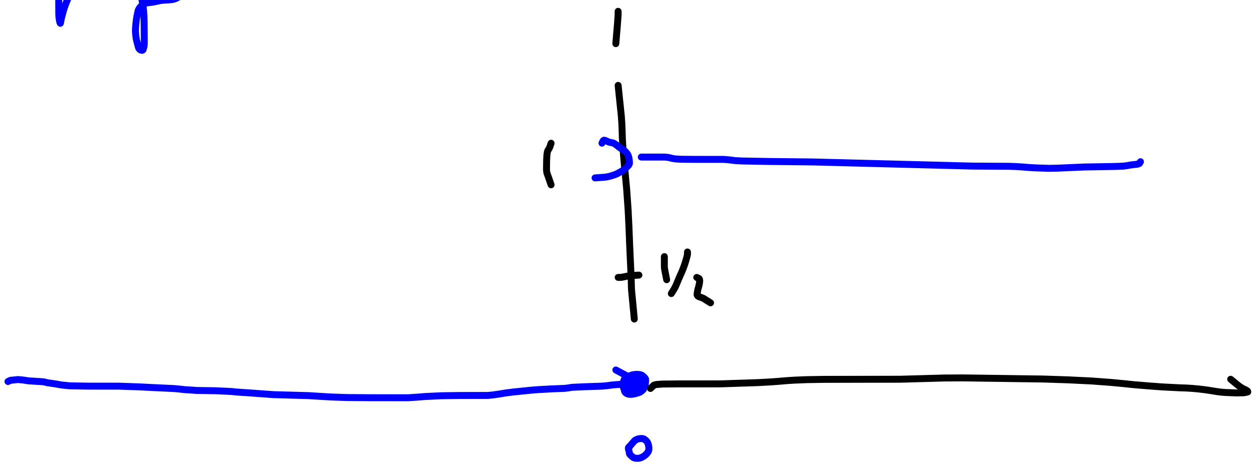
$$\downarrow \qquad \downarrow$$

$$0 \qquad 0$$

$$\frac{f(x)}{g(x)} \to \frac{a}{b}$$

Spojitá:

$$f(x)=\begin{cases}0, & x\le 0\\ 1, & x>0\end{cases}$$

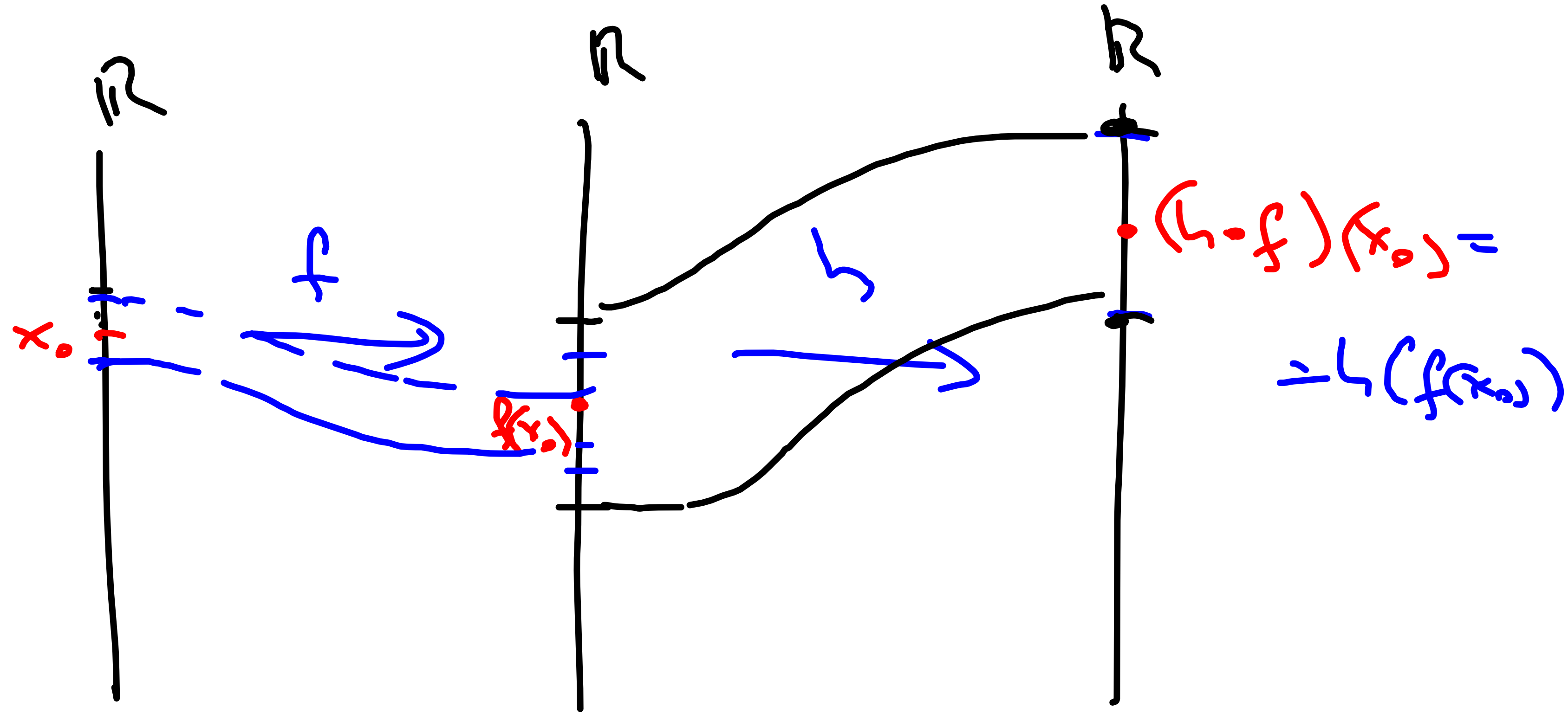


je spojitá zleva v 0

spojitá v $x\neq 0$

$$\lim_{x\to x_0}\big(f(x)+g(x)\big) = \underbrace{\lim_{x\to x_0} f(x)}_{=f(x_0)} + \underbrace{\lim_{x\to x_0} g(x)}_{=g(x_0)}$$

$$= (f+g)(x_0)$$

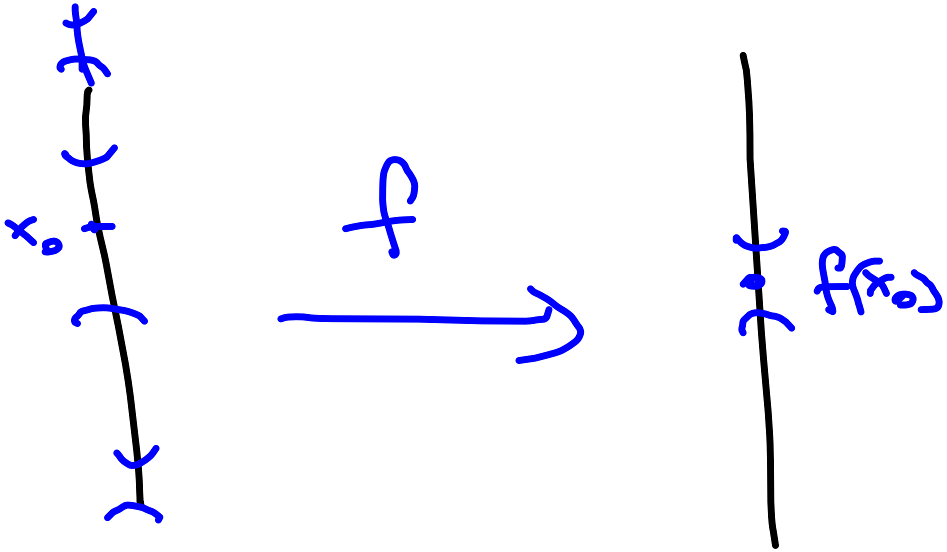

ℝ
ℝ
ℝ
f
h
x_0
$f(x_0)$
$(h\circ f)(x_0)=$
$=h(f(x_0))$

uzavřené $B \subset \mathbb{R} \iff$ všechny hraniční body B jsou v B

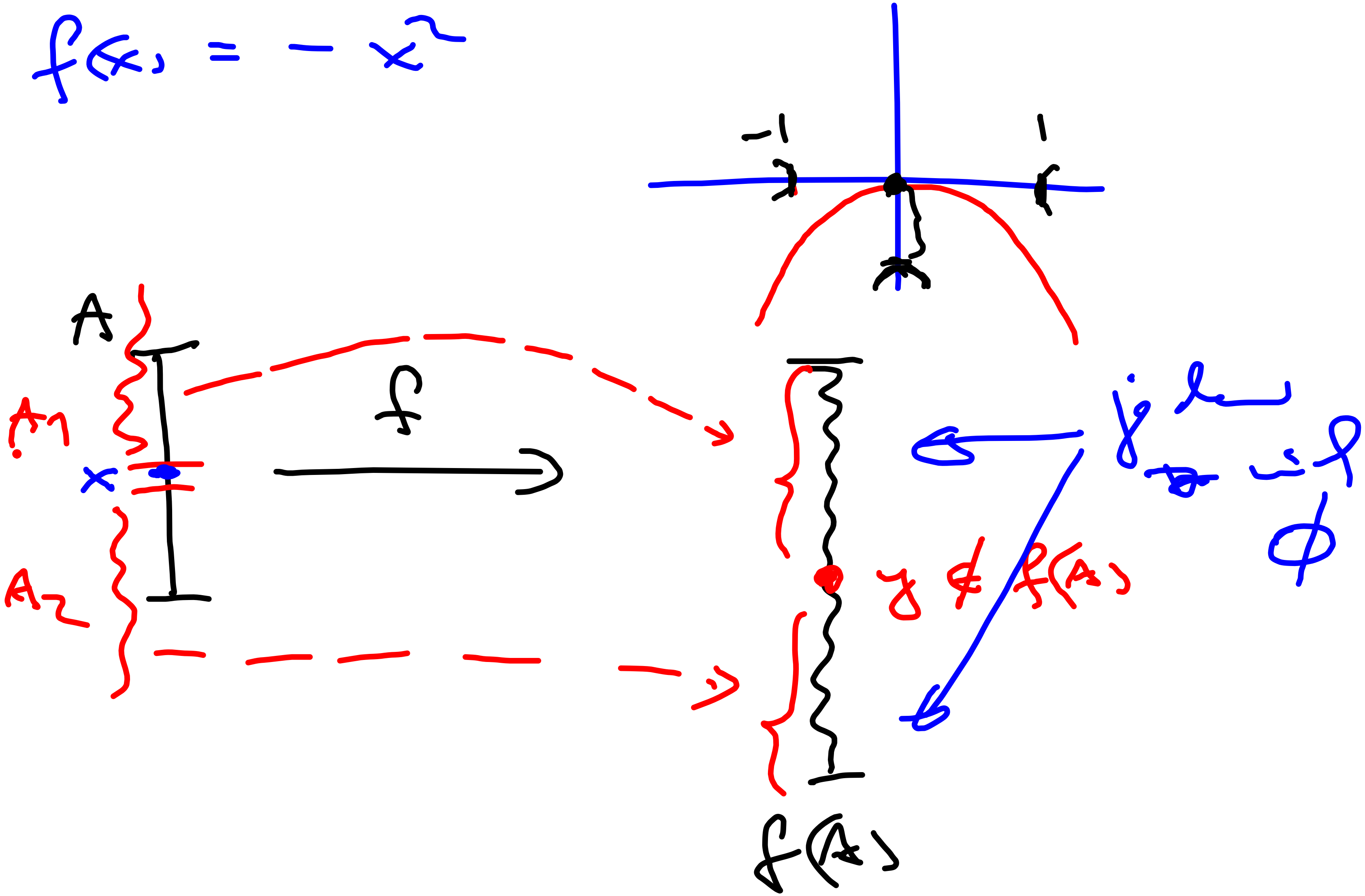
otevřené $U \subset \mathbb{R} \iff \mathbb{R} \setminus U$ je uzavřená

ohraničená $A \subset \mathbb{R} \iff [-N, N] \supset A$, $N \in \mathbb{N}$

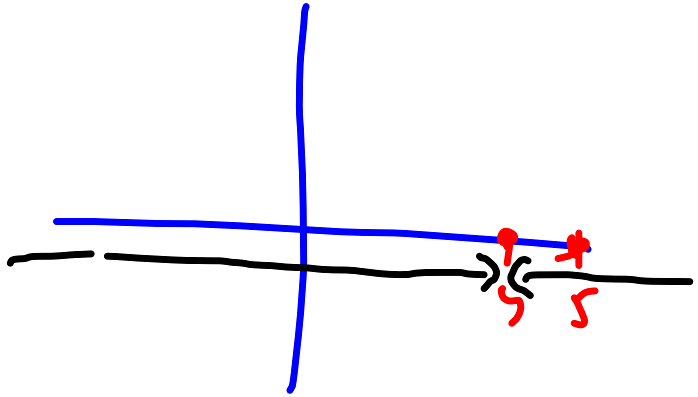
kompaktní $K \subset \mathbb{R} \iff$ uzavřená a ohraničená!



$f(x) = -x^2$

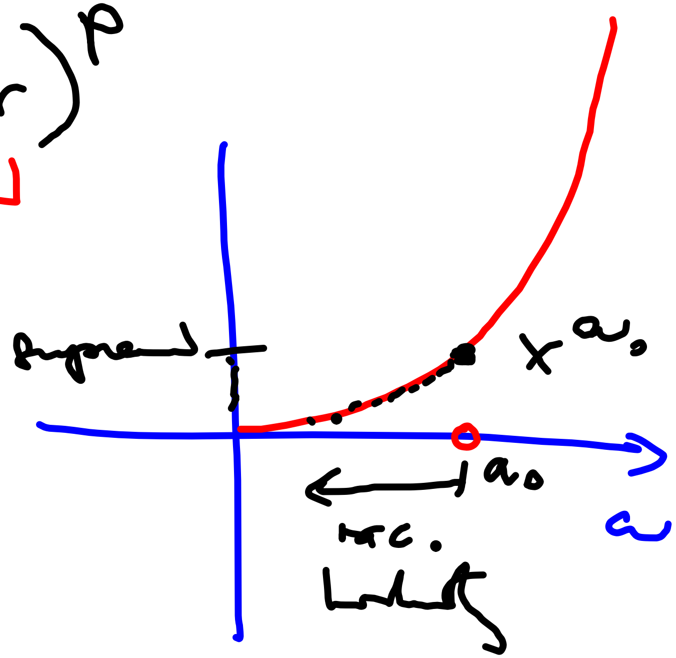


$$\frac{\cancel{(x-5)}(x-3)}{\cancel{(x-5)}(x-4)}$$



$$f(x_0) \neq 0$$

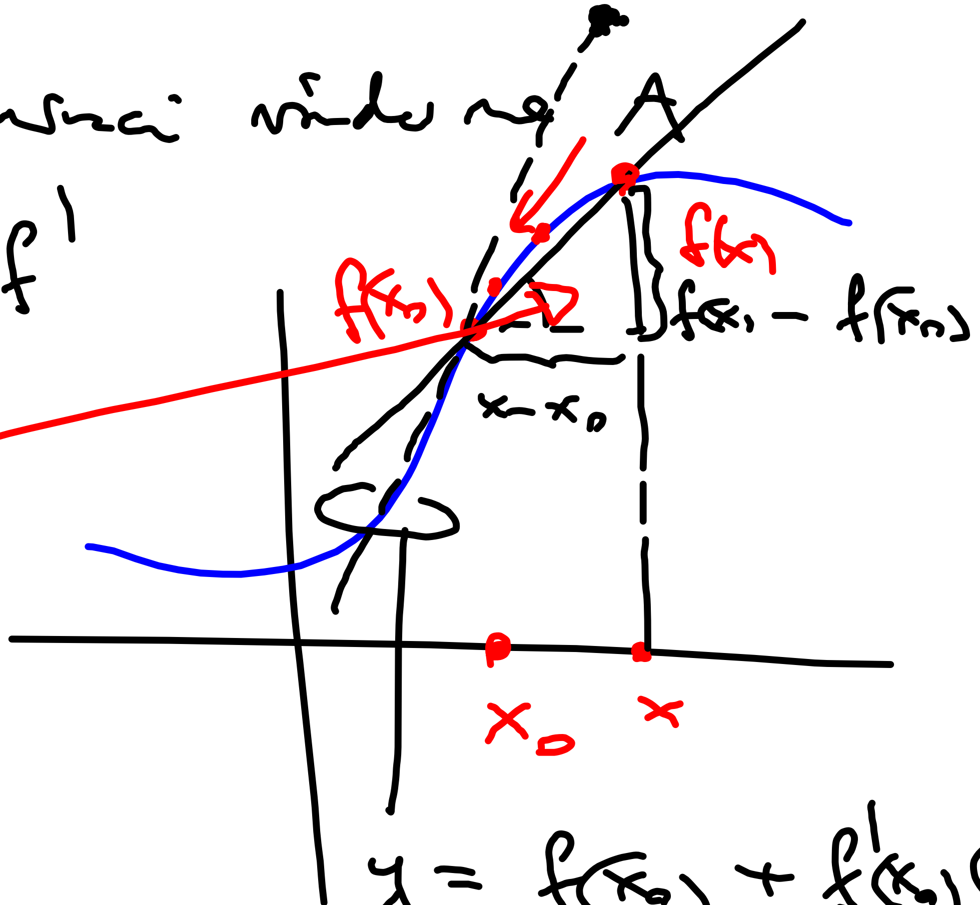
$$a = p/q \qquad x^a = (x^{1/q})^p$$



f mající derivaci v bodě A

$$\frac{d}{dx} : f \longmapsto f'$$

směrnice sečny $= \varphi(x)$



$$y = f(x_0) + f'(x_0)(x - x_0)$$

tečna

$$f(x) = f(x_0) + \varphi(x)(x - x_0)$$

spojitá f-ce

$$\frac{f(x)-f(x_0)}{(x-x_0)} =: \psi(x)$$

↑ spojité v x_0

a $\psi(x_0) := f'(x_0)$

kladné $\Rightarrow$ rostoucí $f(x)$

$$f(x) - f(x_0) = \psi(x)(x-x_0)$$

$\psi(x_0) > 0 \Rightarrow \psi(x) > 0$ v okolí