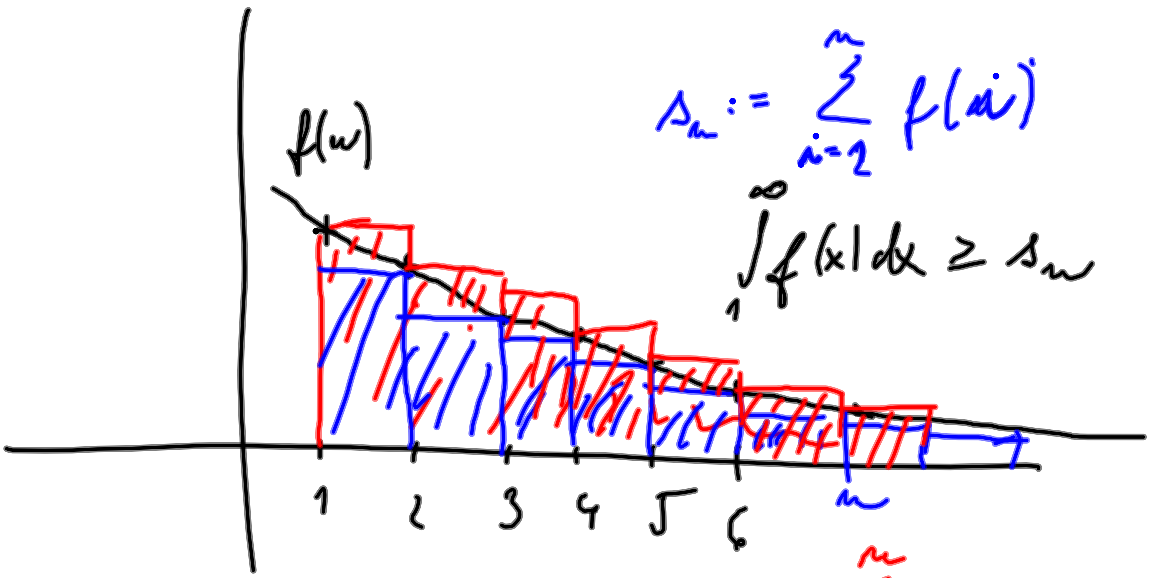
$$\int f'(x)\cdot g(f(x))\,dx = \int g(t)\,dt$$

$$\int \frac{1}{\cos^3 x}\,dx = \frac{tg x}{\cos x} - \int tg x \cdot \frac{\sin x}{\cos^2 x} =$$

$$\begin{cases} u = \frac{1}{\cos x} & u' = +\frac{\sin x}{\cos^2 x} \\ v' = \frac{1}{\cos^2 x} & v = tg x \end{cases}$$

$$\int \frac{\cos x}{\cos^4 x}\,dx = \int \frac{\cos x}{(1-\sin^2 x)^2}\,dx = \int \frac{1}{(1-t^2)^2}\,dt$$

$$\sum_{n=1}^{\infty} f(n) \text{ konverguje} \Leftrightarrow \int_1^{\infty} f(x)\,dx \text{ konverguje}$$



$$s_n := \sum_{i=1}^{n} f(i)$$

$$\int_1^{\infty} f(x)\,dx \geq s_n$$

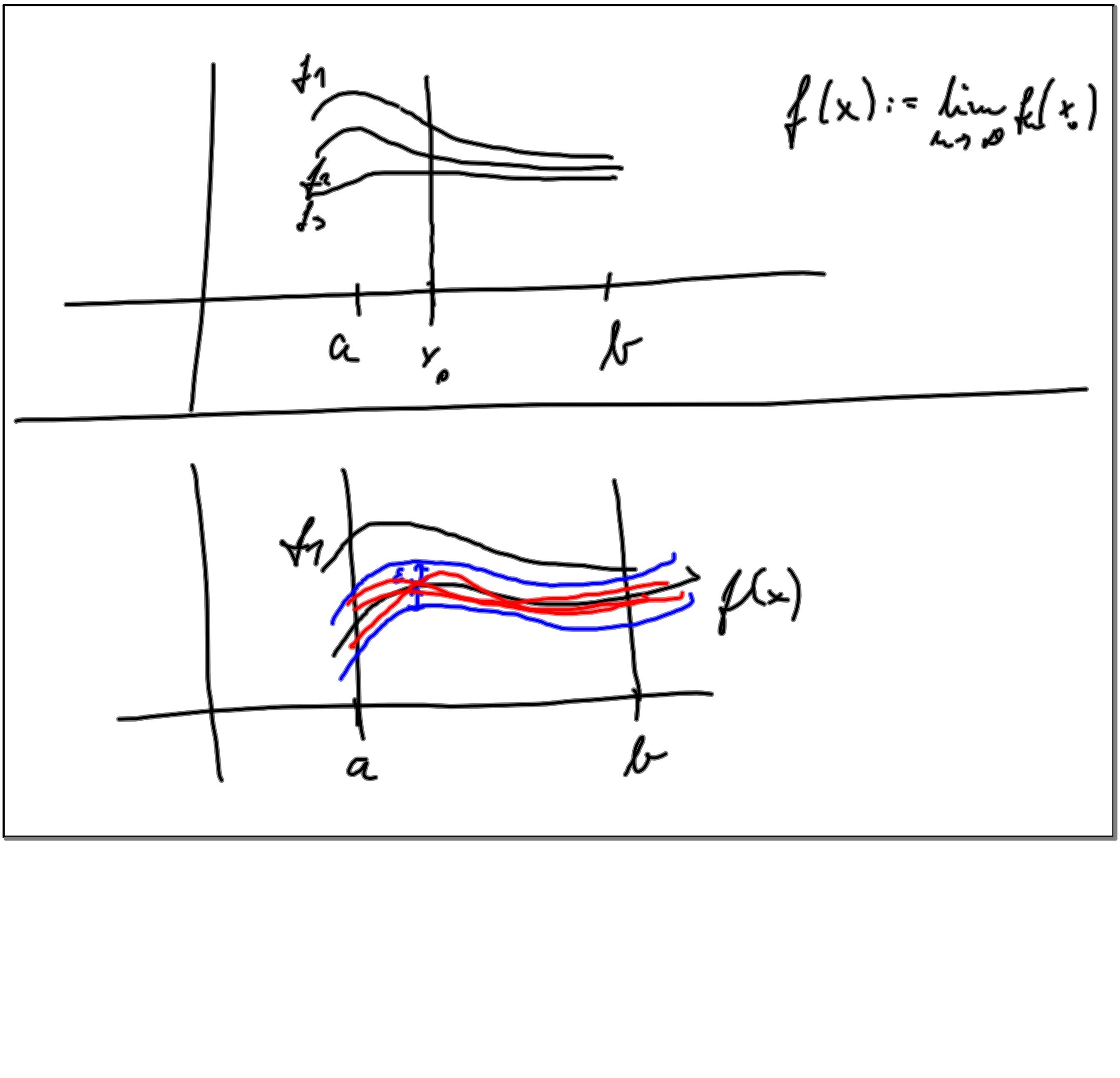
$$s_n = \sum_{i=1}^{n} f(i)$$

$$R_k = \sum_{n=1}^{\infty} \frac{1}{n^k}$$

$$\int_1^{\infty} \frac{1}{x^k}\,dx = \lim_{\delta \to \infty} \int_1^{\delta} \frac{1}{x^k}\,dx =$$

$$= \left[\frac{1}{1-k} x^{1-k}\right]_1^{\delta} = \lim_{\delta \to \infty} \frac{\delta^{1-k}}{1-k} - \frac{1}{1-k} =$$

$$= \begin{cases} 0 & k > 1 \\ \infty & k < 1 \end{cases}$$



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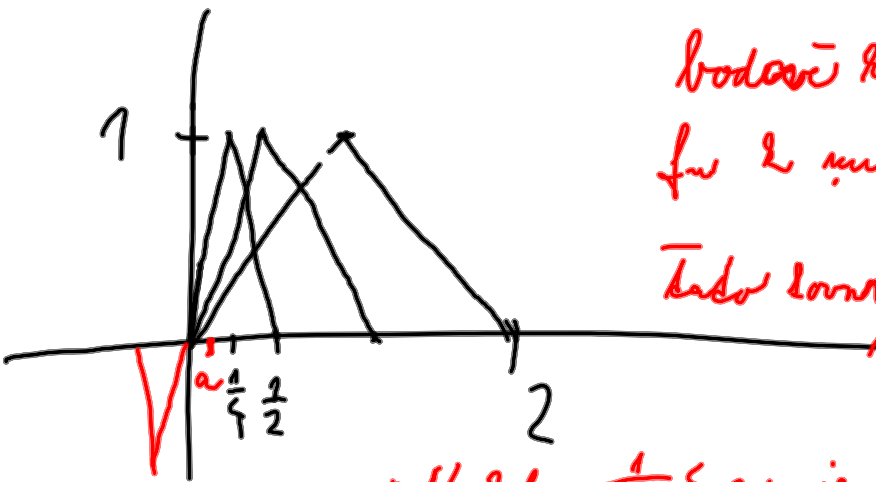
$$f_n = \begin{cases} nx & x \in \langle 0, \frac{1}{n} \rangle \\ 2 - nx & x \in \langle \frac{1}{n}, \frac{2}{n} \rangle \\ 0 & \text{jinak} \end{cases}$$



bodově konverguje f_n k nulové fci na $\mathbb{R}$

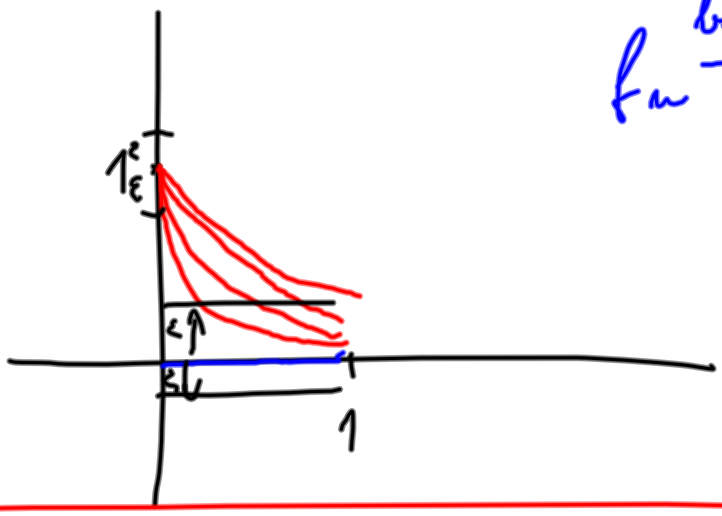
Tato konvergence ovšem není stejnoměrná

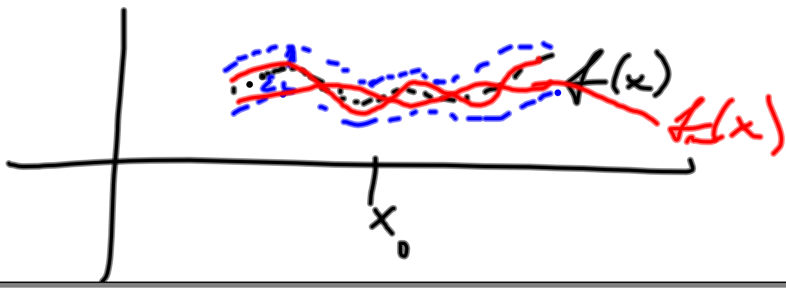
$n > N$, kde $\frac{1}{N} < a$ je $f_n(a) = 0$

$$f_n = e^{-nx} = \frac{1}{e^{nx}}$$

$$f_n \xrightarrow{\text{bodově}} 0 \text{ na } (0,1)$$

$$1 \text{ v } 0$$





$f_n \rightrightarrows f$

$g_i := f_{i+1} - f_i \Rightarrow \sum_{i=1}^{n} g_i \rightrightarrows f$

$\varepsilon, \quad N$

$$\left| f_n(x) - f(x) \right| = \left| f_n(x) - \lim_{m \to \infty} f_m(x) \right| =$$

$$= \lim_{m \to \infty} \left| f_n(x) - f_m(x) \right| \le \varepsilon.$$

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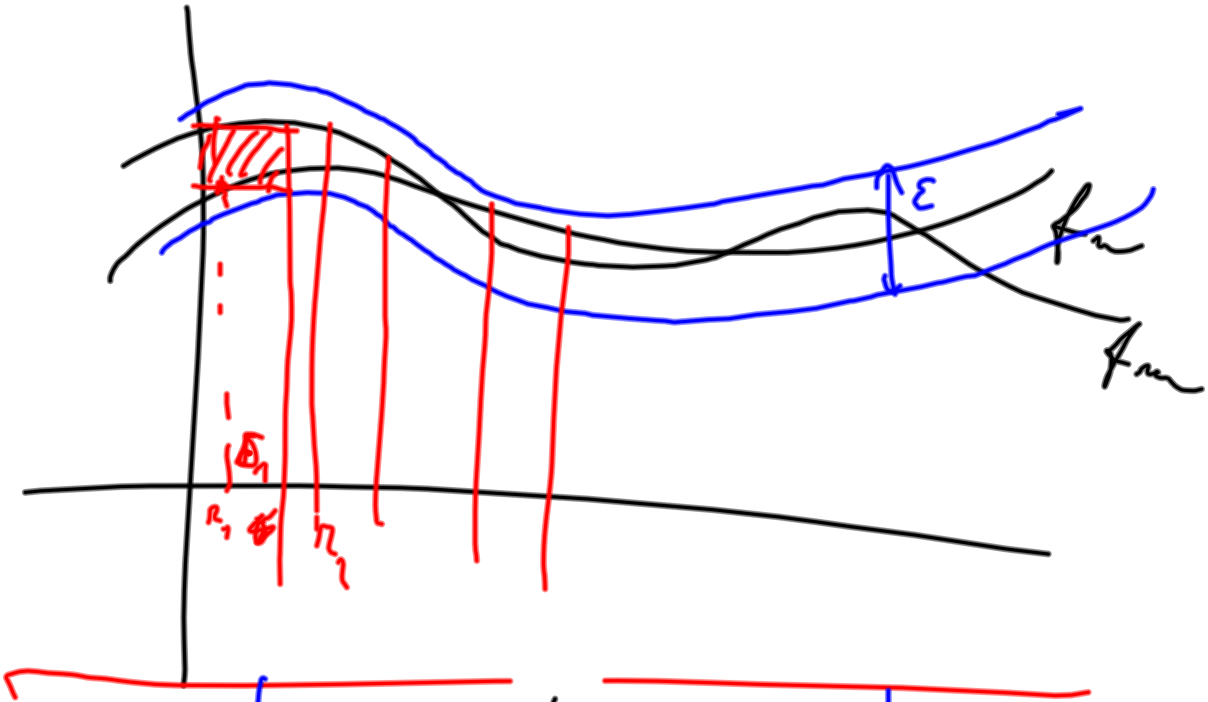

$$f(x) = \int_a^x f'(t)\,dt + f(a)$$

$$f_n(x) = \int_a^x g_n(t)\,dt$$

$$\lim_{n\to\infty} f_n(x) = \lim_{n\to\infty} \int_a^x g_n(t)\,dt$$

$$f(x) = \int_a^x \underbrace{\lim_{n\to\infty} g_n(t)}_{g(t)}\,dt$$

$$\Rightarrow \quad f'(x) = g(x) \quad \text{na } \langle a, b\rangle$$

$$S_n(x) := \sum_{i=1}^{n} f_i(x),$$

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