Cesàrovská sumace

$\rightarrow$ C. sumace

$\sum a_n \qquad \lim_{n\to\infty} \frac{S_0 + S_1 + \dots + S_n}{n+1} \overset{?}{=} \sigma$

$$\sum_{n=1}^{\infty} n = \underset{a_0}{1} + \underset{a_1}{2} + \underset{a_2}{3} + 4 + 5$$

$S_0 = 1$

$S_1 = 1+2 = 3$

$S_2 = 1+2+3 = 6$

$S_3 = 1+2+3+4 = 10$

$\vdots$

$S_n = \qquad = \frac{(n+1)(n+2)}{2} \qquad \frac{(3+1)(3+2)}{2} = 10$

$$\lim_{n\to\infty} \frac{S_0 + S_1 + S_2 + \dots + S_n}{n+1} = \lim_{n\to\infty} \underbrace{\frac{1+3+6+10+\dots+\frac{(n+1)(n+2)}{2}}{n+1}}_{*}$$

$= \infty$

$* \geq \frac{\frac{(n+1)(n+2)}{2}}{n+1} \qquad \lim_{n\to\infty} \frac{(n+1)(n+2)}{2(n+1)} = \infty$

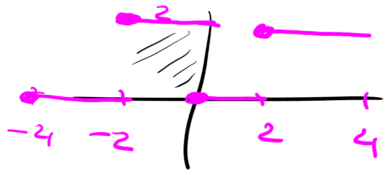
1 policajt

Jiné periody

$$a_k = \frac{1}{L}\int_{-L}^{L} f(x)\cos\left(\frac{\pi k x}{2}\right)dx \qquad k\in\mathbb{N}_0$$

$$b_k = \frac{1}{L}\int_{-L}^{L} f(x)\sin\left(\frac{\pi k x}{2}\right)dx \qquad k\in\mathbb{N}$$

Př.
$$f(x) = \begin{cases} 0 & x\in[0,2) \\ 2 & x\in[2,4) \end{cases}$$

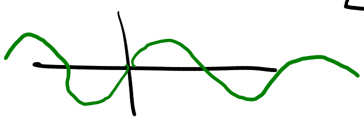


$2L = 4 \qquad L = 2$

$$a_0 = \frac{1}{2}\int_{-2}^{2} f(x) = \frac{1}{2}\int_{-2}^{0} 2\,dx = \frac{1}{2}\,2\cdot 2 = \underline{\underline{2}}$$

$$a_k = \frac{1}{2}\int_{-2}^{2} f(x)\cos\left(\frac{\pi k x}{2}\right)dx = \frac{1}{2}\int_{-2}^{0} 2\cos\left(\frac{\pi k x}{2}\right)dx =$$

$$= \left[\frac{2}{k\pi}\sin\frac{\pi k x}{2}\right]_{-2}^{0} = 0 - \underbrace{\frac{2}{k\pi}\sin\frac{\pi k(-2)}{2}}_{0} = 0$$



$$b_k = \frac{1}{2}\int_{-2}^{0} 2\sin\frac{\pi k x}{2}\,dx = \left[\frac{2}{k\pi}\left(-\cos\left(\frac{\pi k x}{2}\right)\right)\right]_{-2}^{0} = \frac{-2}{k\pi} - \frac{-2}{k\pi}\cos(k\pi)$$

$$= \frac{-2}{k\pi}\left(1-(-1)^k\right) \qquad \begin{cases} 0 & k \text{ sudé} \\ \frac{-4}{k\pi} & k \text{ liché} \end{cases}$$

$$f = \frac{2}{2} + \sum_{k=1}^{\infty} \frac{-2}{k\pi}\left(1-(-1)^k\right)\sin\frac{kx\pi}{2}$$