$$\sum (-1)^n \frac{n+1}{n^2-3} \qquad \sum \cos(n\pi) \frac{n+1}{n^2-3} \qquad \boxed{\text{Leibniz}}$$

Leibniz

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

klesající: $\quad a_n \geq a_{n+1}$?

$$\frac{n+1}{n^2-3} \geq \frac{n+2}{(n+1)^2-3} \qquad \text{pro } n \geq 2 \text{ násobíme}$$

$$(n+1)(n^2+2n-2) \geq (n+2)(n^2-3)$$

$$\cancel{n^3}+\cancel{2n^2}-\cancel{2n}+n^2+\cancel{2n}-2 \geq \cancel{n^3}-3n+\cancel{2n^2}-6$$

$$n^2+3n+4 \geq 0 \quad \checkmark$$

derivace:

$$f'(x) = \left(\frac{x+1}{x^2-3}\right)' = \frac{x^2-3-(x+1)\cdot 2x}{(x^2-3)^2}$$

$$x^2-3-2x^2-2x = -x^2-2x-3$$

$x \in (\sqrt{3}, \infty)$

pro $x > \sqrt{3}$: $\quad f'(x) < 0$

tedy $f \searrow 0$

$$\sum \frac{\cos(3n)}{\sqrt{n+1}} \cdot \frac{n}{n+1}$$

(a) om. č. součty $\cos(3n)$ } Dir. $\sum \frac{\cos 3n}{\sqrt{n+1}}$

$b_n = \frac{1}{\sqrt{n+1}} \searrow$ nerostoucí

(b) $\frac{n}{n+1} = c_n$

$\lim c_n = 1$ $\quad$ c_n je neklesající

$\frac{n}{n+1} = 1 + \frac{-1}{n+1}$

$$\sum \frac{\cos 3n}{\sqrt{n+1}} + -\sum \frac{\cos(3n)}{\sqrt{n+1}} \cdot \frac{1}{n+1}$$

$\frac{1}{n+1}$ nerost., nezáp., Abel konv.

→ součet 2 konv.

→ $\sum$ konverguje