

Limity posloupností ($n \rightarrow \infty$)

$$\lim \frac{9n+2}{18n-40} = \frac{1}{2}$$

$$\lim \frac{n^8 - n^3 + 150}{15 - 4n^4} = \infty$$

$$\lim \frac{(n+1)^4 - (n-1)^4}{(n+1)^4 + (n-1)^4} = 0$$

$$\lim_{m \rightarrow \infty} \left(\frac{m}{m+1} + \frac{1}{k} \right) = 1 + \frac{1}{k} \quad m, k \in \mathbf{N}$$

$$\lim_{k \rightarrow \infty} \left(\frac{m}{m+1} + \frac{1}{k} \right) = \frac{m}{m+1} \quad m, k \in \mathbf{N}$$

$$\lim \left(\frac{1}{10^5} n^4 - 10^5 n \right) = \infty$$

$$\lim (4\sqrt[3]{n^5} - 15\sqrt[4]{n^7} - 6\sqrt{n}) = -\infty$$

$$\lim (\sqrt{n^2 + 3n} - n) = \frac{3}{2}$$

$$\lim \left(\sqrt{n + \sqrt{n + \sqrt{n}}} - \sqrt{n} \right) = \frac{1}{2}$$

$$\lim (\sqrt[3]{n-5} - \sqrt[3]{n+5}) = 0$$

$$\lim (\sqrt{n+3\sqrt{n}} - \sqrt{n+1}) = \frac{3}{2}$$

$$\lim \frac{\sqrt[4]{n^5+2} - \sqrt[3]{n^2+1}}{\sqrt[5]{n^4+2} - \sqrt{n^3+1}} = 0$$

$$\lim \left(\frac{8n-1}{n} \cdot \sqrt{\frac{n}{9n+1}} \right) = \frac{8}{3}$$

$$\lim \frac{1+2+3+\dots+n}{n^2} = \frac{1}{2}$$

$$\lim \frac{1+a+a^2+\dots+a^n}{1+b+b^2+\dots+b^n} = \frac{b-1}{a-1}$$

$$\text{kde } a, b \in \mathbf{R}, |a| < 1, |b| < 1$$

$$\lim \frac{(n+2)! + (n+1)!}{(n+3)!} = 0$$

$$\lim \left(\frac{1}{1 \cdot 3} + \frac{1}{3 \cdot 5} + \dots + \frac{1}{(2n-1)(2n+1)} \right) = \frac{1}{2}$$

$$\lim \frac{(-2)^{n+1}}{1+(-2)^n} = -2$$

$$\lim \frac{5^n + 2 \cdot 3^{n+1}}{5^{n-1} - 2^n} = 5$$

$$\lim \frac{\left(\frac{1}{2}\right)^n}{\left(\frac{1}{4}\right)^n - \left(\frac{1}{3}\right)^n} = -\infty$$

$$\lim \left(\frac{n+4}{n+3} \right)^{n+3} = e$$

$$\lim \left(1 + \frac{1}{6n} \right)^{4n+5} = e^{\frac{2}{3}}$$

$$\lim \frac{(-1)^n \cdot n}{2n+1} \text{ neex.}$$

$$\lim \frac{2n \cdot \cos \sqrt{n}}{\sqrt{n^3+2}} = 0$$

$$\lim \frac{e^{\sin n}}{n^3+3} = 0$$

$$\lim \frac{2e^{\cos n^2} + 3n - 4}{5 + 8n} = \frac{3}{8}$$

Jak zvolit čísla $a, b \in \mathbf{R}$ tak, aby

$$a) \quad \lim \left(\frac{3n}{n-2} - an - b \right) = 0$$

$$b) \quad \lim \left(an + b - \frac{n-1}{2n+1} \right) \neq 0$$

a přitom je vlastní.

(Řešení: a) $a = 0, b = 3$, b) $a = 0, b \neq \frac{1}{2}$)