3. minitest MA1

Varianta A

8. 11. 2024

Vypočtěte limitu posloupnosti.

$$\lim_{n\to\infty} \frac{(\frac{2}{3})^{5n} + (\frac{7}{5})^{n+1} + (\frac{4}{3})^{2n+1}}{(\frac{16}{9})^{\frac{2n+1}{2}} + (\frac{12}{7})^{n+1}}$$

$$= \lim_{n\to\infty} \frac{\left(\frac{16}{9}\right)^n \cdot \left(\left(\frac{9}{16}\right)^n \cdot \left(\frac{2}{3}\right)^{5n} + \left(\frac{7}{5}\cdot\frac{9}{16}\right)^n \cdot \frac{7}{5} + \frac{4}{3}\right)}{\left(\frac{16}{9}\right)^{n\cdot\frac{1}{2}} \cdot \left(\left(\frac{16}{9}\right)^{\frac{1}{2}} + \frac{12}{7}\cdot\left(\frac{12}{7}\cdot\frac{9}{16}\right)^n\right)} =$$

$$\frac{80}{45} = \frac{16}{9} > \frac{7}{5} = \frac{63}{45}$$

$$\frac{112}{63} = \frac{16}{9} > \frac{12}{7} = \frac{108}{63}$$

$$= \lim_{n\to\infty} \frac{\left(\frac{9}{16}\right)^n \cdot \left(\frac{2}{3}\right)^{5n} + \frac{7}{5}\left(\frac{63}{80}\right)^n + \frac{4}{3}}{\frac{4}{3} + \frac{12}{7}\cdot\left(\frac{27}{28}\right)^n}$$

$$\text{VOAL} = \frac{0\cdot 0 + \frac{7}{5}\cdot 0 + \frac{4}{3}}{\frac{4}{3} + \frac{12}{7}\cdot 0} = 1 =$$

3. minitest MA1

Varianta B

8. 11. 2024

Vypočtěte limitu posloupnosti.

$$\lim_{n\to\infty} \frac{(\frac{7}{5})^{n+1} + (\frac{4}{3})^{2n-1}}{(\frac{6}{7})^{5n} + (\frac{16}{9})^{\frac{2n+1}{2}} + (\frac{12}{7})^{n+1}}$$

$\frac{63}{45} = \frac{7}{5} < \frac{16}{9} = \frac{80}{45}$

$\frac{108}{63} = \frac{12}{7} < \frac{16}{9} = \frac{112}{63}$

$$= \lim_{n\to\infty} \frac{\left(\frac{16}{9}\right)^n \cdot \left(\frac{7}{5} \cdot \left(\frac{7\cdot 12}{5\cdot 16}\right)^n + \left(\frac{4}{3}\right)^{-1}\right)}{\left(\frac{16}{9}\right)^n \cdot \left(\left(\frac{6}{7}\right)^{5n} \cdot \left(\frac{9}{16}\right)^n + \left(\frac{16}{9}\right)^{\frac{1}{2}} + \frac{12}{7} \cdot \left(\frac{12}{7}\cdot\frac{9}{16}\right)^n\right)}$$

$$= \lim_{n\to\infty} \frac{\frac{7}{5} \cdot \left(\frac{63}{80}\right)^n + \frac{3}{4}}{\left(\frac{6}{7}\right)^{5n} \cdot \left(\frac{9}{16}\right)^n + \frac{4}{3} + \frac{12}{7} \cdot \left(\frac{27}{28}\right)^n}$$

VOAL $= \frac{0 + \frac{3}{4}}{0 + \frac{4}{3} + 0} = \frac{9}{16}$