

Rezultati - grupa A
13.11.2006.

Zadatak1.

$$\lim_{n \rightarrow \infty} \frac{(\sqrt{n^2 + 1} + n)^2}{\sqrt[3]{n^6 - 1} + 1} = \lim_{n \rightarrow \infty} \frac{2n^2 + 2n\sqrt{n^2 + 1} + 1}{\sqrt[3]{n^6 - 1} + 1} =$$
$$\lim_{n \rightarrow \infty} \frac{2 + 2\sqrt{1 + \frac{1}{n^2} + \frac{1}{n^2}}}{\sqrt[3]{1 - \frac{1}{n^6} + \frac{1}{n^2}}} = \frac{2 + 2}{1} = 4.$$

Zadatak2.

$$\lim_{n \rightarrow \infty} \frac{3^n + 3^{n-1} + \dots + 3 + 1}{3^n + 3^{n-1}} = \lim_{n \rightarrow \infty} \frac{\frac{3^{n+1} - 1}{3 - 1}}{3^n + 3^{n-1}} = \lim_{n \rightarrow \infty} \frac{9 - \frac{1}{3^{n-1}}}{2(3 + 1)} = \frac{9}{8}.$$

Zadatak3. Izračunajte

$$\lim_{x \rightarrow 0} \left(\frac{2x + 3}{3} \right)^{\frac{3-2x}{x}} = \lim_{x \rightarrow 0} \left(\left(\left(1 + \frac{2}{3}x \right)^{\frac{1}{x}} \right)^3 \cdot \left(1 + \frac{2}{3}x \right)^{-2} \right) = (e^{\frac{2}{3}})^3 \cdot 1 = e^2.$$

Zadatak4.

$$\lim_{x \rightarrow 0} x \cdot \frac{1}{\operatorname{tg} 2x} = \frac{1}{2},$$
$$\alpha + \cos 0 = \frac{1}{2} \Rightarrow \alpha = -\frac{1}{2}.$$

Rezultati - grupa B
13.11.2006.

Zadatak1.

$$\lim_{n \rightarrow \infty} \frac{(\sqrt{n^2 - 1} + n)^2}{\sqrt[4]{n^8 - 1} + 1} = \lim_{n \rightarrow \infty} \frac{2n^2 + 2n\sqrt{n^2 - 1} - 1}{\sqrt[4]{n^8 - 1} + 1} =$$
$$\lim_{n \rightarrow \infty} \frac{2 + 2\sqrt{1 - \frac{1}{n^2} - \frac{1}{n^2}}}{\sqrt[4]{1 - \frac{1}{n^8} + \frac{1}{n^2}}} = \frac{2 + 2}{1} = 4.$$

Zadatak2.

$$\lim_{n \rightarrow \infty} \frac{5^n + 5^{n-1}}{5^n + 5^{n-1} + \dots + 5 + 1} = \lim_{n \rightarrow \infty} \frac{5^n + 5^{n-1}}{\frac{5^{n+1} - 1}{5 - 1}} = \lim_{n \rightarrow \infty} \frac{4(5 + 1)}{25 - \frac{1}{5^{n-1}}} = \frac{24}{25}.$$

Zadatak3.

$$\lim_{x \rightarrow 0} \left(\frac{3x + 2}{2} \right)^{\frac{2-3x}{x}} = \lim_{x \rightarrow 0} \left(\left(\left(1 + \frac{3}{2}x \right)^{\frac{1}{x}} \right)^2 \cdot \left(1 + \frac{3}{2}x \right)^{-3} \right) = (e^{\frac{3}{2}})^2 \cdot 1 = e^3.$$

Zadatak4.

$$\lim_{x \rightarrow 0} \frac{x}{\sin 2x} = \frac{1}{2},$$
$$\beta + \sin\left(-\frac{\pi}{2}\right) = \frac{1}{2} \Rightarrow \beta = \frac{3}{2}.$$