

## ZADACI ZA SAMOSTALNI RAD

1) Ispitati monotonost i ograničenost sledećih nizova:

- (a)  $\{\frac{1}{n}\}_{n \in \mathbb{N}}$
- (b)  $\{\frac{n}{n+2}\}_{n \in \mathbb{N}}$
- (c)  $\{1 + (-1)^n\}_{n \in \mathbb{N}}$
- (d)  $\{n^2 - 10n - 20\}_{n \in \mathbb{N}}$
- (e)  $\{n\}_{n \in \mathbb{N}}$

2) Odrediti:

$$1. \lim_{n \rightarrow \infty} \frac{4n^2 + 3n + 5}{3n^3 + 5n^2 + 1}$$

$$2. \lim_{n \rightarrow \infty} \frac{n^2 + n - 1}{(n + 1)^2}$$

$$3. \lim_{n \rightarrow \infty} \frac{n^7 - 3n^4 + 8n^2 - 10}{6n^6 - 1}$$

$$4. \lim_{n \rightarrow \infty} \frac{n^2 + n}{3n^3 + 2n - 1}$$

$$5. \lim_{n \rightarrow \infty} \frac{\sqrt{n} - 6n}{3n + 1} =$$

$$6. \lim_{n \rightarrow \infty} \frac{2n^4 + n^2}{n^2 + 1}$$

$$7. \lim_{n \rightarrow \infty} \frac{\sqrt{n^2 - 2n} - \sqrt{4n^2 - 2n + 1}}{5n}$$

$$8. \lim_{n \rightarrow \infty} \frac{\sqrt{2n} - 5n}{4n - 1} =$$

$$9. \lim_{n \rightarrow \infty} \left( \frac{2n^2 + 1}{2n - 3} - \frac{n^2 + \frac{1}{2}}{n - 2} \right)$$

$$10. \lim_{n \rightarrow \infty} \left( \frac{2n + 1}{3n - 5} \right)^3$$

$$11. \lim_{n \rightarrow \infty} \frac{\sqrt{n^4 + 1}}{n^2 - \sqrt[5]{2n^{10} + 3}}$$

$$12. \lim_{n \rightarrow \infty} \frac{\sqrt{2n^4 - 3n^3} + 3n^2}{\sqrt[3]{n^6 + n}}$$

$$13. \lim_{n \rightarrow \infty} n(\sqrt{n^2 + 1} - n)$$

$$14. \lim_{n \rightarrow \infty} (\sqrt{n + 1} - \sqrt{n})$$

$$15. \lim_{n \rightarrow \infty} (\sqrt{n^2 - 3n + 2} - n + 1)$$

$$16. \lim_{n \rightarrow \infty} (\sqrt[3]{n^2 + 3n - 7} - \sqrt[3]{n^2 - n + 4})$$

$$17. \lim_{n \rightarrow \infty} (\sqrt{n^2 + 2n} - n)$$

$$18. \lim_{n \rightarrow \infty} (\sqrt[3]{n^3 + 2n^2} - \sqrt[3]{n^3 - 2})$$

$$19. \lim_{n \rightarrow \infty} \frac{7^{n+2} + 4^n}{7^n + 4^{n+1}}$$

$$20. \lim_{n \rightarrow \infty} \frac{(-2)^n + 3^n}{(-2)^{n+1} + 3^{n+1}}$$

$$21. \lim_{n \rightarrow \infty} \frac{3^{2n+1} - 2^n - 5}{4^n - 2^n + 1}$$

$$22. \lim_{n \rightarrow \infty} \frac{7^{n+1} + 3^n}{9^{n+2} - 3^{n+1}}$$

$$23. \lim_{n \rightarrow \infty} \frac{2^{n+1} + 3^n + \sqrt[n]{3}}{3^{n+1} + 2^n + \sqrt[n]{2}}$$

$$24. \lim_{n \rightarrow \infty} \frac{5 + 3^{n+1}}{7 \cdot 2^{n+1} + 3^{n+2}}$$

$$25. \lim_{n \rightarrow \infty} \left( \frac{n}{n+1} \right)^n$$

$$26. \lim_{n \rightarrow \infty} \left( \frac{3n-2}{3n} \right)^{n-1}$$

$$27. \lim_{n \rightarrow \infty} \left( \frac{n+2}{n+1} \right)^{3n+5}$$

$$28. \lim_{n \rightarrow \infty} \left( \frac{n+2}{n+3} \right)^{2n+1}$$

$$29. \lim_{n \rightarrow \infty} \left( \frac{n^2+2n-7}{n^2-3n+7} \right)^{2n-1}$$

$$30. \lim_{n \rightarrow \infty} \left( 1 + \frac{4}{n} \right)$$

$$31. \lim_{n \rightarrow \infty} \left( \frac{3n-2}{3n+1} \right)^{n+1}$$

$$32. \lim_{n \rightarrow \infty} \left( 1 + \frac{n+1}{n^2+1} \right)^n$$

$$33. \lim_{n \rightarrow \infty} \left( 1 + \frac{n+1}{n^2+1} \right)^{\frac{1}{n^2}}$$