PONAVLJANJE

1. Nađi inverz i determinantu od matrice $A = \begin{bmatrix} 3 & -4 & 5 \\ 2 & -3 & 1 \\ 3 & -5 & -1 \end{bmatrix}$. (Rj: $A^{-1} = \begin{bmatrix} -8 & 29 & -11 \\ -5 & 18 & -7 \\ 1 & -3 & 1 \end{bmatrix}$)

2. Nađi inverz i determinantu od matrice $B = \begin{bmatrix} 2 & 7 & 3 \\ 3 & 9 & 4 \\ 1 & 5 & 3 \end{bmatrix}$. (Rj: $B^{-1} = -\frac{1}{3}\begin{bmatrix} -7 & 6 & -1 \\ 5 & -3 & -1 \\ -6 & 3 & 3 \end{bmatrix}$)

3. Nađi inverz i determinantu od matrice $C = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -1 \\ 2 & -2 & 1 \end{bmatrix}$. (Rj: $C^{-1} = \frac{1}{9}\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$)

4. Riješi matričnu jednadžbu $\begin{bmatrix} 1 & 2 & -3 \\ 3 & 2 & -4 \\ 2 & -1 & 0 \end{bmatrix} \cdot X = \begin{bmatrix} 1 & -3 & 0 \\ 10 & 2 & 7 \\ 10 & 7 & 8 \end{bmatrix}$. (Rj: $X = \begin{bmatrix} 6 & 4 & 5 \\ 2 & 1 & 2 \\ 3 & 3 & 3 \end{bmatrix}$)

5. Riješi matričnu jednadžbu $X \cdot \begin{bmatrix} 5 & 3 & 1 \\ 1 & -3 & -2 \\ -5 & 2 & 1 \end{bmatrix} = \begin{bmatrix} -8 & 3 & 0 \\ -5 & 9 & 0 \\ -2 & 15 & 0 \end{bmatrix}$.

(Rj: $X = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$, $A^{-1} = \frac{1}{19}\begin{bmatrix} 1 & -1 & -3 \\ 9 & 10 & 11 \\ -13 & -25 & -18 \end{bmatrix}$)

6. Riješi matričnu jednadžbu $\begin{bmatrix} 2 & -3 & 1 \\ 4 & -5 & 2 \\ 5 & -7 & 3 \end{bmatrix} \cdot X \cdot \begin{bmatrix} 9 & 7 & 6 \\ 1 & 1 & 2 \\ 1 & 1 & 1 \end{bmatrix} = \begin{bmatrix} 2 & 0 & -2 \\ 18 & 12 & 9 \\ 23 & 15 & 11 \end{bmatrix}$.

(Rj: $X = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$)

7. Riješi sustav jednadžbi:

$$2x_1 + 3x_2 + 11x_3 + 5x_4 = 2$$
$$x_1 + x_2 + 5x_3 + 2x_4 = 1$$
$$2x_1 + x_2 + 3x_3 + 2x_4 = -3$$
$$x_1 + x_2 + 3x_3 + 4x_4 = -3$$

. (Rj: $(-2, 0, 1, -1)$)

8. Riješi sustav jednadžbi:

$$x + y - z = 2$$
$$-x + 2y + z = 0$$
$$x + 3z = 5$$
$$-x - y + 2z = 6$$

. (Rj: nema ga)

9. Integriraj: $\int x\sqrt[5]{5 - x^2}\ dx.$ (Rj: $-\frac{5}{12}\sqrt[5]{(5 - x^2)^6} + C$)

10. Integriraj: $\int x \sin(1 - x^2)\ dx.$ (Rj: $\frac{1}{2}\cos(1 - x^2) + C$)

11. Integriraj: $\int x \cos 3x\ dx.$ (Rj: $\frac{x \sin 3x}{3} + \frac{\cos 3x}{9} + C$)

12. Integriraj: $\int \frac{dx}{x^2 + 2x}.$ (Rj: $\frac{1}{2}\ln|\frac{x}{x+2}| + C$)

13. Integriraj: $\int \frac{x^4}{x^4 - 1}\ dx.$ (Rj: $x + \frac{1}{4}\ln|\frac{x-1}{x+1}| - \frac{1}{2}\operatorname{arctg} x + C$)

14. Integriraj: $\int \frac{x^3 - 1}{4x^3 - x}\ dx.$ (Rj: $\frac{1}{4}x + \frac{1}{16}\ln|\frac{x^{16}}{(2x-1)^7(2x+1)^9}| + C$)

15. Integriraj: $\int \cos^3 x\ dx.$ (Rj: $\sin x - \frac{1}{3}\sin^3 x + C$)

16. Integriraj: $\displaystyle\int sin^2 x \cdot \cos^4 x \; dx.$ (Rj: $\frac{x}{16} - \frac{\sin 4x}{64} + \frac{\sin^3 2x}{48} + C$)

17. Integriraj: $\displaystyle\int \sqrt[3]{\frac{x+1}{x-1}}\, dx.$ (Rj: $\frac{1}{3}\ln|\frac{z^2+z+1}{(z-1)^2}| + \frac{2\sqrt{3}}{3}\operatorname{arctg}\frac{\sqrt{3}(2z+1)}{3} + \frac{2z}{z^3-1}$ uz $z = \sqrt[3]{\frac{x+1}{x-1}}$)

18. Integriraj: $\displaystyle\int x\sqrt{\frac{x-1}{x+1}}\, dx.$ (Rj: $\frac{\sqrt{x^2-1}}{2}(x-2) + \frac{1}{2}\ln|x+\sqrt{x^2-1}| + C$)

19. Integriraj: $\displaystyle\int \frac{3x-6}{\sqrt{x^2-4x+5}}\, dx.$ (Rj: $3\sqrt{x^2-4x+5} + C$)

20. Ispitaj konvergenciju reda $\displaystyle\sum_{n=1}^{\infty} \frac{2n-1}{(\sqrt{2})^n}$ koristeći D'Alambertov kriterij.

(Rj: $q = \sqrt{2}/2$, dakle kvg)

21. Ispitaj konvergenciju reda $\displaystyle\sum_{n=1}^{\infty} \left(\frac{n+1}{2n-1}\right)^n$ koristeći Cauchyev kriterij.

(Rj: 1/2, dakle kvg)