

ZADACI ZA SAMOSTALNI RAD

1) Odrediti vrednost sledećih determinanti:

$$1. \begin{vmatrix} 2 & -2 \\ 5 & -1 \end{vmatrix} \quad 2. \begin{vmatrix} -2 & -2 \\ 5 & 3 \end{vmatrix} \quad 3. \begin{vmatrix} \sqrt{2} & -2 \\ 0 & -\sqrt{2} \end{vmatrix} \quad 4. \begin{vmatrix} i & i^7 \\ -i^3 & -i \end{vmatrix} \quad 5. \begin{vmatrix} 1-i & 0 \\ 5 & i^6 \end{vmatrix}$$

2) Odrediti vrednost sledećih determinanti:

$$1. \begin{vmatrix} 1 & 4 & 5 \\ 6 & 7 & -3 \\ -2 & 1 & 0 \end{vmatrix} \quad 2. \begin{vmatrix} -5 & -6 & 7 \\ 8 & -9 & 0 \\ -3 & 4 & 2 \end{vmatrix} \quad 3. \begin{vmatrix} 1 & 2 & 3 \\ -1 & 2 & 4 \\ 0 & 1 & 2 \end{vmatrix} \quad 4. \begin{vmatrix} 1 & 2x & 3 \\ -1 & 2x & 4 \\ 0 & x & 2 \end{vmatrix} \quad 5. \begin{vmatrix} 7 & 8 & 3 \\ 5 & 14 & 1 \\ -4 & -7 & -1 \end{vmatrix}$$

3) Odrediti vrednost sledećih determinanti:

$$1. \begin{vmatrix} 1 & -1 & 0 & 2 \\ 3 & 1 & 4 & 1 \\ 0 & 0 & 1 & -3 \\ 1 & -1 & 0 & 4 \end{vmatrix} \quad 2. \begin{vmatrix} 3 & 7 & -5 & -2 \\ 4 & 2 & 0 & -6 \\ 0 & 2 & 0 & -1 \\ -9 & 2 & 3 & 6 \end{vmatrix} \quad 3. \begin{vmatrix} 2 & 6 & 6 & 2 \\ 2 & 7 & 3 & 6 \\ 1 & 5 & 0 & 1 \\ 3 & 7 & 0 & 7 \end{vmatrix} \quad 4. \begin{vmatrix} 1 & 6 & 0 & 2 \\ 2 & 4 & 3 & -1 \\ 3 & -3 & 0 & 1 \\ -1 & 2 & 0 & 2 \end{vmatrix} \quad 5. \begin{vmatrix} 2 & -1 & 3 & 0 \\ -3 & 1 & 0 & 4 \\ -2 & 1 & 4 & 1 \\ -1 & 3 & 0 & -2 \end{vmatrix}$$

4) Odrediti $z \in C$, ako je $\begin{vmatrix} z & i & 2 \\ -1 & -2 & 0 \\ 3 & -i & 1 \end{vmatrix} = 2 - 3i$.

5) Izračunati $z \in C$, ako je $Re(z) > 0$ i $\begin{vmatrix} z & 1 & i \\ 0 & -1 & \bar{z} \\ 1 & 2 & 0 \end{vmatrix} = -8 + 2i$.

6) Rešiti jednačine:

$$1. \begin{vmatrix} x^2 & 4 & 9 \\ x & 2 & 3 \\ 1 & 1 & 1 \end{vmatrix} = 0 \quad 2. \begin{vmatrix} x+1 & 2 & 3 \\ -3 & -5 & 1 \\ -2 & 2x & 1 \end{vmatrix} = 0 \quad 3. \begin{vmatrix} 3 & x & -4 \\ 2 & -1 & 3 \\ x+10 & 1 & 1 \end{vmatrix} = 0 \quad 4. \begin{vmatrix} 2 & 2 & 4 & 5 \\ 2 & 6-x^2 & 4 & 5 \\ 3 & 4 & 2 & 6 \\ 3 & 4 & 2 & 6-x^2 \end{vmatrix} = 0$$

7) Rešiti jednačinu $\begin{vmatrix} x-6 & 1 & -3 & x-4 & 2x-1 \\ 7 & 2x+3 & 4 & x+6 & 3 \\ 2x-3 & 3 & x-3 & x-3 & x \\ 5 & x+1 & 4 & x+6 & 1 \\ -5 & 1 & -3 & x-4 & x \end{vmatrix} = 0$.

8) Dokazati $\begin{vmatrix} a & a & a \\ -a & a & x \\ -a & -a & x \end{vmatrix} = 2a^2x$.

9) Dokazati $\begin{vmatrix} 1 & i & 1+i \\ -i & 1 & 0 \\ 1-i & 0 & 1 \end{vmatrix} = -2$.

10) Dokazati $\begin{vmatrix} 1 + \cos \alpha & 1 + \sin \alpha & 1 \\ 1 - \sin \alpha & 1 + \cos \alpha & 1 \\ 1 & 1 & 1 \end{vmatrix} = 1$.

11) Dokazati $\begin{vmatrix} 1 & a & 2 \\ 2a & 1-a & -1 \\ a-2 & 3 & -a \end{vmatrix} = (a+1)(2a^2+7)$.

12) Dokazati $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (b-a)(c-a)(c-b)$

13) (a) Izračunati vrednost determinante $D = \begin{vmatrix} 1 & 1 & 1 & 1 \\ 1 & a & a^2 & a^3 \\ 1 & a^2 & a^4 & a^6 \\ 1 & a^3 & a^6 & a^9 \end{vmatrix}$.

(b) Izračunati vrednost determinante D za $a = i$.