

### Determinante

1. Izračunajte determinante sljedećih matrica:

$$\text{a) } A = \begin{bmatrix} 2+a & 1+b \\ a & b \end{bmatrix} \quad \text{b) } B = \begin{bmatrix} \frac{1+a^2}{1-a^2} & \frac{2a}{1-a^2} \\ \frac{2a}{1-a^2} & \frac{1+a^2}{1-a^2} \end{bmatrix}$$

2. Zapišite sljedeće izraze pomoću determinante 2.reda:

$$\begin{array}{ll} \text{a) } 5xy - 3xy & \text{d) } \log(xy) \\ \text{b) } a^2 + b^2 - c^2 & \text{e) } \log\left(\frac{x}{y}\right) \\ \text{c) } -x^2 & \text{f) } \cos^2\alpha - \sin^2\alpha \end{array}$$

3. Izračunajte determinante sljedećih matrica:

$$\begin{array}{ll} \text{a) } A = \begin{bmatrix} 1 & 2 & -1 \\ 2 & -1 & 1 \\ 3 & -5 & 2 \end{bmatrix} & \text{b) } B = \begin{bmatrix} 7 & 2 & -1 \\ 2 & -1 & 1 \\ -7 & -5 & 2 \end{bmatrix} \\ \text{c) } C = \begin{bmatrix} 3 & 1 & 2 & 4 \\ 0 & 0 & -1 & 6 \\ 2 & 1 & 3 & 1 \\ 2 & -2 & 3 & 1 \end{bmatrix} & \end{array}$$

4. Korištenjem svojstava determinanti izračunajte sljedeće determinante:

$$\begin{array}{ll} \text{a) } \begin{vmatrix} 1 & 2 & 0 & 1 \\ 2 & 3 & -1 & 0 \\ 0 & -1 & 2 & 4 \\ -1 & 0 & 4 & -1 \end{vmatrix} & \text{c) } \begin{vmatrix} 0 & 2 & 1 & \dots & 1 & 0 \\ 0 & 0 & 2 & \dots & 2 & 0 \\ \vdots & & & & & \vdots \\ 0 & 0 & 0 & \dots & 0 & 2 \\ 2 & 0 & 1 & \dots & 1 & 1 \end{vmatrix} \\ \text{b) } \begin{vmatrix} 6 & 2 & -2 & 8 & 2 \\ 4 & 1 & -1 & 4 & 6 \\ 6 & -2 & 3 & 6 & 8 \\ 2 & 1 & -1 & 3 & 4 \\ 5 & -2 & 3 & 6 & 1 \end{vmatrix} & \end{array}$$

5. Riješite sljedeće jednačbe:

$$\text{a) } \begin{vmatrix} x-2 & -2 \\ 3 & 1-x \end{vmatrix} = 0$$

$$\text{b) } \begin{vmatrix} x & 1 & 0 \\ 2 & x & 2 \\ 0 & 1 & x \end{vmatrix} = 0$$

6. Izračunajte determinante sljedećih matrica:

$$\text{a) } A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & a & a \\ 1 & a^2 & a^2 \end{bmatrix}$$

$$\text{b) } B = \begin{bmatrix} x & 1 & 0 \\ 2 & x & 2 \\ 0 & 1 & x \end{bmatrix}$$

7. Provjerite da li je polinom  $p(x)$  djeljiv s  $(x-1)^3$ :

$$p(x) = \begin{vmatrix} 1 & x & x^2 & x^3 \\ 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & 4 \\ 1^2 & 2^2 & 3^2 & 4^2 \end{vmatrix}$$