

Pečunite odmah!

IME I PREZIME:

LUKA BORZIC

BROJ INDEKSA: 17-2-0016-2010

DATUM: 21.2.2012. VRIJEME: OD

DO

MATEMATIKA 1: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

5
Broj ↓
bodova

15+5

1. Izračunati inverz dane matrice (ako postoji) i provjeriti matričnim množenjem da je inverz dobro izračunat.

$$A = \begin{bmatrix} 0 & 1 & 0 & -1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ -1 & 0 & 1 & 0 \end{bmatrix}$$

2. Ako su z_1 i z_2 rjesenja kvadratne jednadzbe $z^2 - 2z + 2 = 0$, izracunati: $\overline{\left(\frac{z_1 - z_2}{z_2 - 2}\right)}$ i $Re\left(\overline{\left(\frac{z_2}{z_1}\right)}\right)$.

10+10

3. Zadana je funkcija $f(x) = e^{-x^2}$. Odrediti domenu, prvu derivaciju i sve asimptote funkcije.

5+5+5+5

4. Ispitati periodičnost, (ne)parnost i drugu derivaciju funkcije $g(x) = \arccos(3x)$.

5+5+10

5. Na temelju ispitivanja toka napraviti skicu grafa funkcije $h(x) = x - \frac{1}{x+1}$.

20

1.

$$A = \begin{bmatrix} 0 & 1 & 0 & -1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ -1 & 0 & 1 & 0 \end{bmatrix}$$

$$\left[\begin{array}{cccc|cccc} 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 \\ -1 & 0 & 1 & 0 & 0 & 0 & 0 & 1 \end{array} \right] \sim$$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 \\ -1 & 0 & 1 & 0 & 0 & 0 & 0 & 1 \end{array} \right] \sim \left[\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 & 0 & 1 \end{array} \right] \xrightarrow{(-1)} \left[\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 & 0 & 1 \end{array} \right] \xrightarrow{+}$$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 & 0 & 1 \end{array} \right] \sim \left[\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 2 & 0 & -1 & 0 & 1 & 0 \end{array} \right] \begin{array}{l} :2 \\ :2 \end{array} \sim$$

$$\left[\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1/2 & 0 & 1/2 \\ 0 & 0 & 0 & 1 & -1/2 & 0 & 1/2 & 0 \end{array} \right] \xrightarrow{+(-1)} \sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \end{array} \right] \begin{array}{l} :2 \\ :2 \end{array} \sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & 0 & 1/2 & 0 & -1/2 \\ 0 & 1 & 0 & 0 & 0 & 1/2 & 0 & 1/2 \\ 0 & 0 & 1 & 0 & 0 & 1/2 & 0 & 1/2 \\ 0 & 0 & 0 & 1 & -1/2 & 0 & 1/2 & 0 \end{array} \right]$$

$$2. z^2 - 2z + 2 = 0$$

$$\overline{\left(\frac{z_1 - z_2}{z_2 - z_1} \right)} \neq \operatorname{Re} \left(\frac{z_2}{z_1} \right)$$

$$3. f(x) = e^{-x^2}$$

1) DOMENA $D_f = \mathbb{R}$ ✓

2) 1. DERIVACIJA

$$f(x) = e^{-x^2}$$

$$f'(x) = -2xe^{-x^2}$$
 ✓

3) VERTIKALNE ASIMPTOTE nema jer nema
kružimaka ✓

$$K_1 = \lim_{x \rightarrow +\infty} \frac{f(x)}{x} = \frac{e^{-x^2}}{x} = \frac{0}{\infty} = 0$$

NEMA
KOSIH

$$K_2 = \lim_{x \rightarrow -\infty} \frac{f(x)}{x} = \frac{e^{-x^2}}{x} = \frac{0}{-\infty} = 0$$

ASIMPTOTA

$$l = \lim_{x \rightarrow \pm\infty} \frac{f(x)}{x-x} = \lim_{x \rightarrow \pm\infty} f(x) =$$

$$\lim_{x \rightarrow \pm\infty} e^{-x^2} = e^{-\infty} = 0$$
 ✓

HORIZONTALNA
ASIMPTOTA

$y = 0$ // ✓

