Popuniti odmah!
IME I PREZIME: DINO CVITAN BROJ INDEKSA: 17-2-0068
DATUM: VRIJEME: OD 12:15 DO 13:00 .
MATEMATIKA 1: Trajanje 100 minuta. Zabranjen je razgovor sa drugim studentima. ZADATKE RIJEŠAVATE JEDNOSTRANO NA PAPIRE KOJE DOBIJETE OD NASTAVNIKA.

oooo
Broj ↓ bodova

1. Koju relaciju zadovoljava inverz matrice? Provjeriti tu relaciju za inverz matrice (ako postoji)

$$A = \begin{bmatrix} 2 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 2 \end{bmatrix}.$$

0

2. Pronaći sve kompleksne brojeve z takve da je $z^3 + |3i + 4| = \frac{5}{i^{233}}$. 10

3. Odrediti domenu i sve asimptote funkcije $f(x) = \ln\left(\frac{x+5}{1-x}\right)$. 10

4. Ispitati domenu, periodičnost, (ne)parnost i prvu derivaciju funkcije $g(x) = \cos(\sin(3x))$. 10

5. Na temelju ispitivanja toka funkcije napraviti skicu grafa funkcije f iz zadatka 3. 0

UKUPNO 30

IME I PREZIME: DINO CVITAN BROJ INDEKSA: 17-2-0068

$i^{233:4} = i^1$

2. $z^3 + |3i+4| = \frac{5}{i^{233}}$

(271)

$z^3 + \sqrt{4^2+3^2} = \frac{5}{i} \cdot \frac{i}{i}$

$z^3 + \sqrt{16+9} = \frac{5i}{i^2}$

$z^3 = -\sqrt{25} + \frac{5i}{-1}$

$z^3 = -5 - 5i \quad / \sqrt[3]{\ }$

$z = \sqrt[3]{-5-5i}$

$-5-5i$

Za $x<0$ vrijedi

$\varphi = \pi + \arctan\frac{y}{x}$

VIDI SEMINAR 4.

$r = \sqrt{x^2+y^2} = \sqrt{(-5)^2+(-5)^2} = \sqrt{25+25} = \sqrt{50} = 7.071$

$\text{kut}\,\varphi_0 = \left|\frac{y}{x}\right| = \left|\frac{-5}{-5}\right| = 1 \quad \varphi_0 = 0.785$

$\varphi = 2\pi - \varphi_0 = 5.495$

$z = r = 7.071\left(\cos\frac{\varphi+2k\pi}{3} + i\sin\frac{\varphi+2k\pi}{3}\right)$

10

$k=0 \quad w_1 = 7.071\left(\cos 1.831 + i\sin 1.831\right)$

$= 7.071\left(-0.259 + i\,0.966\right)$

$k=1 \quad w_2 = 7.071\left(\cos 3.925 + i\sin 3.925\right)$

$= 7.071\left(-0.7085 + i\,0.7056\right)$

$k=2 \quad w_3 = 7.071\left(\cos 6.018 + i\sin 6.018\right)$

$= 7.071\left(0.965 + i\,0.262\right)$

IME I PREZIME: DINO CVITAN BROJ INDEKSA: 17-2-0068

1. $A = \begin{bmatrix} 2 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 2 \end{bmatrix}$ $\det A \begin{vmatrix} 2 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 2 \end{vmatrix}$ (-2)

$\sim \begin{vmatrix} 0 & 0 & 0 & -3 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 2 \end{vmatrix} = a_{41} A_{41} = 1 \cdot (-1)^5 = -1 \begin{vmatrix} 0 & 0 & -3 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{vmatrix} = -1\, a_{31} A_{31} = -1\,(-1)^4 = -1 \begin{vmatrix} 0 & -3 \\ 1 & 0 \end{vmatrix}$

$= -1\,(0 \cdot 0 - (-3)1) = -1\,(0+3) = -3 \neq 0$ // $\det A \neq 0$

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

$\sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 2 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -3 & 1 & 0 & 0 & -2 \end{array}\right] \sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 2 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & -3 & 1 & 0 & 0 & -2 \end{array}\right]$ ✗

$A^{-1} \left[\begin{array}{cccc|cccc} 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & -2 \end{array}\right]$

VIDI NEKIĆ

0

IME I PREZIME: DINO CVITAN BROJ INDEKSA: 17-2-0063

4. $g(x) = \cos(\sin(3x))$

$g(x)' = -\sin(\sin(3x)) \cdot (\sin(3x))'$

$= -\sin(\sin(3x)) \cdot \cos 3x \cdot 3x'$

$= -\sin(\sin(3x)) \cdot \cos 3x \cdot 3$ ✓ 10

~~$g(x)' = (\cos)'(\sin)'(3x) + (\sin)(3x)' + (\cos)(\sin)'(3x) + (\sin)(3x)'$~~

~~$= \sin(\cos 3x + \sin 3) + \cos($~~

IME I PREZIME: DINO CVITAN BROJ INDEKSA: 17-2-0068

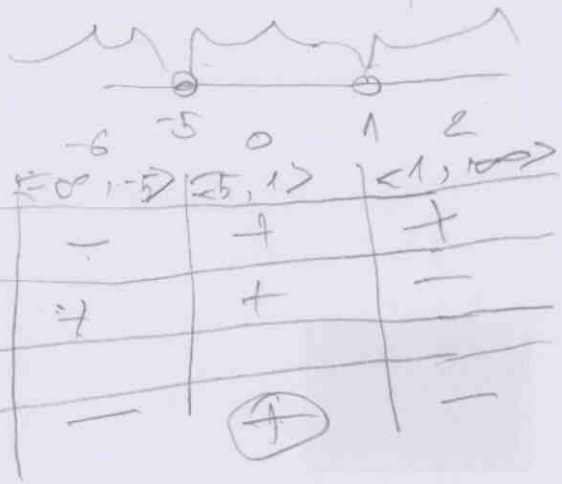
3. $f(x) = \ln\left(\frac{x+5}{1-x}\right)$

$\frac{x+5}{1-x} > 0$

$x+5>0 \qquad 1-x \neq 0$

$x > -5 \qquad -x > -1 \ /\cdot(-1)$

$x < 1$



$D(f) = \langle -5, 1 \rangle$ ✓ 10

ASIMPTOTE?

Popuniti odmah!

IME I PREZIME: ZLATKO LALIĆ BROJ INDEKSA: 57676

DATUM: VRIJEME: OD 12:10 DO 13:10

MATEMATIKA 1: Trajanje 100 minuta. Zabranjen je razgovor sa drugim studentima. ZADATKE RIJEŠAVATE JEDNOSTRANO NA PAPIRE KOJE DOBIJETE OD NASTAVNIKA.

oooo
Broj ↓ bodova

30

1. Koju relaciju zadovoljava inverz matrice? Provjeriti tu relaciju za inverz matrice (ako postoji)

$$A = \begin{bmatrix} 2 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 2 \end{bmatrix}.$$

20

2. Pronaći sve kompleksne brojeve z takve da je $z^3 + |3i + 4| = \frac{5}{i^{233}}$.

3. Odrediti domenu i sve asimptote funkcije $f(x) = \ln\left(\frac{x+5}{1-x}\right)$.

4. Ispitati domenu, periodičnost, (ne)parnost i prvu derivaciju funkcije $g(x) = \cos(\sin(3x))$.

10

5. Na temelju ispitivanja toka funkcije napraviti skicu grafa funkcije f iz zadatka 3.

1.

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

$$\sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 2 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & -3 & 1 & 0 & 0 & -2 \end{array}\right] \cdot\left(-\frac{1}{3}\right) \sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 2 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{3} & 0 & 0 & \frac{2}{3} \end{array}\right] \cdot(-2)$$

$$\sim \left[\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & \frac{2}{3} & 0 & 0 & -\frac{1}{3} \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{3} & 0 & 0 & \frac{2}{3} \end{array}\right] \quad A^{-1}$$

$-\frac{4}{3} + \frac{3}{3} = -\frac{1}{3}$

$\frac{4}{3} - \frac{1}{3} = \frac{3}{3} = 1$

$\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$

$\frac{2}{3} + 0 + 0 + \frac{2}{3} = \frac{4}{3}$

PROVJERA

$$\begin{bmatrix} 2 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 2 \end{bmatrix} \cdot \begin{bmatrix} \frac{2}{3} & 0 & 0 & -\frac{1}{3} \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ -\frac{1}{3} & 0 & 0 & \frac{2}{3} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

✓ 20

IME I PREZIME: ZLATKO LALIĆ BROJ INDEKSA: 57676

4. $g'(x) = \cos\left[\sin(3x)\right]$

$= -\sin\left[\sin(3x)\right] \cdot \cos(3x) \cdot 3$ ✓ 10

3. $f(x) = \ln\left(\frac{x+5}{1-x}\right)$

$1-x \neq 0$

$x \neq 1$

$D_f = \mathbb{R} \setminus \{1\}$