

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod!!

POPUNJAVA
NASTAVNIK
Broj ↓
bodova

IME I PREZIME:

RJEŠENJE 2

BROJ INDEKSA:

VRIJEME POČETKA:

VRIJEME ZAVRŠETKA:

1. Odrediti kompleksne brojeve z koji zadovoljava jednadžbu $\frac{|z|}{2(z+i)} = 3i$. 20

2. Riješi sustav Gaussovom metodom: 20

$$\begin{array}{rccccrcr} x_1 & - & 2x_2 & + & 3x_3 & - & 4x_4 & = & 0 \\ & & & & x_2 & - & x_3 & + & x_4 & = & 1 \\ x_1 & + & 3x_2 & & & - & 3x_4 & = & 7 \\ & & - & 7x_2 & + & 3x_3 & + & x_4 & = & -15 \end{array}$$

3. Ispitati domenu i sve asimptote funkcije $g(x) = (\sqrt{x^2 - 5x + 1} - x)$. 5+15

4. Ispitati tok i nacrtati graf funkcije: $f(x) = \frac{5-x}{9-x^2}$. 20(graf)

5. Odrediti domenu, periodičnost, (ne)parnost i drugu derivaciju funkcije: $h(x) = \cos(4x)$. 2+5+4+9

Ukupno:

① $|z| = 3i \cdot 2(z+i)$ $z = x+iy$

$$\sqrt{x^2+y^2} = 6i \cdot (x+iy+i)$$

$$\sqrt{x^2+y^2} = 6ix - 6y - 6$$

Realna: $\sqrt{x^2+y^2} = -6y - 6$

Imagin: $0 = 6x \Rightarrow x = 0$

$\sqrt{y^2} = -6y - 6$

$y^2 = y$ za $y > 0$
 $y^2 = -y$ za $y < 0$

$\pm y = -6y - 6 \Rightarrow$ ili $7y = -6 \Rightarrow y = -\frac{6}{7}$ $\& y > 0$ ✗
ili $5y = 6 \Rightarrow y = \frac{6}{5}$ $\& y < 0$ ✗

SAMO 1 RJEŠENJE: $z = \frac{-6}{5}i$

②

$$\begin{bmatrix} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 1 & 3 & 0 & -3 & 7 \\ 0 & -7 & 3 & 1 & -15 \end{bmatrix} \xrightarrow{R3-R1} \begin{bmatrix} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 5 & -3 & 1 & 7 \\ 0 & -7 & 3 & 1 & -15 \end{bmatrix} \xrightarrow{R3-5R2, R4+7R2} \begin{bmatrix} 1 & 0 & 1 & -2 & 2 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 2 & -4 & 2 \\ 0 & 0 & 8 & -8 & -8 \end{bmatrix} \xrightarrow{\cdot \frac{1}{2}} \begin{bmatrix} 1 & 0 & 1 & -2 & 2 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 8 & -8 & -8 \end{bmatrix}$$

~~$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 8 & -8 \end{bmatrix}$~~ ~~$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -1 \end{bmatrix}$~~ ~~$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -1 \end{bmatrix}$~~ $\begin{bmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 & 2 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 0 & -4 \end{bmatrix}$ SUSTAV NEMA RJEŠENJA

③ $g(x) = \sqrt{x^2 - 5x + 1} - x$

LIJEVA ASIMPTOTA: $\lim_{x \rightarrow -\infty} g(x) = +\infty + \infty = +\infty$ NEMA

DOMENA: $x^2 - 5x + 1 \geq 0$

$$x_{1,2} = \frac{5 \pm \sqrt{25-4}}{2}$$

$$x_1 = \frac{5 - \sqrt{21}}{2} \quad x_2 = \frac{5 + \sqrt{21}}{2}$$

DOMENA = $\left\{ x \in \left(-\infty, \frac{5 - \sqrt{21}}{2} \right] \cup \left[\frac{5 + \sqrt{21}}{2}, +\infty \right) \right\}$

$$\lim_{x \rightarrow -\infty} g(x) - kx = \lim_{x \rightarrow +\infty} \sqrt{x^2 - 5x + 1} + x - 2x = \lim_{x \rightarrow +\infty} (\sqrt{x^2 - 5x + 1} - x) \cdot \frac{\sqrt{x^2 - 5x + 1} + x}{\sqrt{x^2 - 5x + 1} + x}$$

$$= \lim_{x \rightarrow +\infty} \frac{x^2 - 5x + 1 - x^2}{\sqrt{x^2 - 5x + 1} + x} = \frac{5}{2}$$

DESNA ASIMPTOTA: $\lim_{x \rightarrow \infty} \frac{(\sqrt{x^2 - 5x + 1} - x) \cdot (\sqrt{x^2 - 5x + 1} + x)}{\sqrt{x^2 - 5x + 1} + x} =$

$$= \lim_{x \rightarrow \infty} \frac{x^2 - 5x + 1 - x^2}{\sqrt{x^2 - 5x + 1} + x} = \dots = -\frac{5}{2} \quad \boxed{x = -\frac{5}{2}}$$

LIJEVA KOSA: $\lim_{x \rightarrow \infty} g(x) = \lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 5x + 1} + x}{-x} =$

$$= \lim_{x \rightarrow \infty} -\sqrt{\frac{x^2 - 5x + 1}{x^2}} - 1 = -2 = k$$

L.K.A. $y = -2x + \frac{5}{2}$

$$4. \quad f(x) = \frac{5-x}{9-x^2} = \frac{5-x}{(3-x)(3+x)}$$

$$\text{DOMĚNA} = \mathbb{R} \setminus \{-3, 3\} = \langle -\infty, -3 \rangle \cup \langle -3, 3 \rangle \cup \langle 3, +\infty \rangle$$

$$f'(x) = \frac{-9+x^2+2x(5-x)}{(9-x^2)^2} = \frac{-9+10x-x^2}{(9-x^2)^2} = 0 \quad \text{za} \quad -9+10x-x^2=0$$

$$x^2-10x+9=0$$

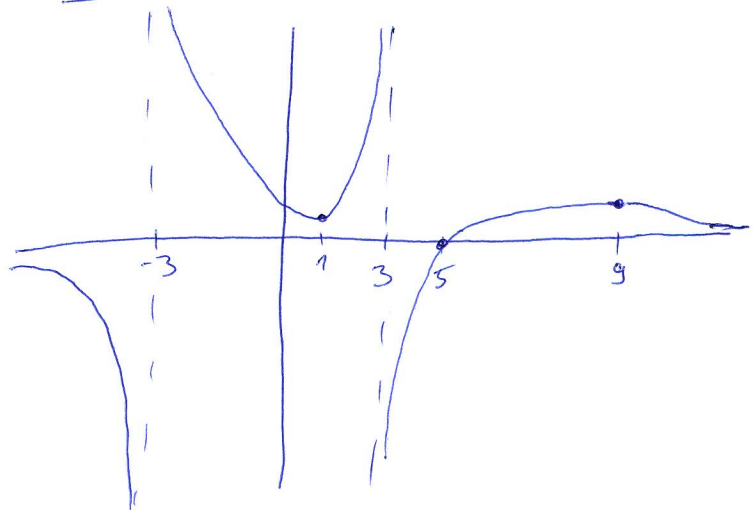
$$x_{1,2} = \frac{10 \pm \sqrt{100-36}}{2} = \frac{10 \pm 8}{2} \rightarrow \begin{matrix} x_1=1 \\ x_2=9 \end{matrix}$$

	$-\infty$	-3	1	3	9	$+\infty$
$f'(x)$		-	-	+	+	-
$f(x)$		\searrow	\searrow	\nearrow	\nearrow	\searrow

LOK MIN $f(1) = \frac{1}{2}$
LOK MAX $f(9) =$

NULOČKA $x=5$

SKICA GRAFA:



$$\lim_{x \rightarrow +0} f(x) = 0$$

$$\lim_{x \rightarrow -\infty} f(x) = 0$$

$$5. \quad h(x) = \cos(4x)$$

$$D(h) = \mathbb{R}$$

$$h(x) = h(x+P) \Leftrightarrow \cos(4x) = \cos(4x+4P) \quad \Rightarrow \quad 4P = 2\pi \Rightarrow P = \frac{\pi}{2} \text{ PERIOD}$$

ZNAMO $\cos(x) = \cos(x+2\pi) \Rightarrow \cos(4x) = \cos(4x+2\pi)$

$$h(-x) = \cos(-4x) = \cos(4x) \quad \Rightarrow \quad h(x) \text{ JE PARNÁ}$$

$\cos(x) = \cos x$

$$h'(x) = 4 \cos'(4x) = -4 \sin(4x)$$

$$h''(x) = -16 \cos(4x)$$

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod!!

IME I PREZIME: **ROKO DUŠEVIĆ**

BROJ INDEKSA: **57359-2009**

VRIJEME POČETKA: **07:57**

VRIJEME ZAVRŠETKA: **09:25**

POPUNJAVA
NASTAVNIK
Broj ↓
bodova

53

1. Odrediti kompleksne brojeve z koji zadovoljava jednačbu $\frac{|z|}{2(z+i)} = 3i$. 20

2. Riješi sustav Gaussovom metodom: 20

$$\begin{array}{rccccrcr} x_1 & - & 2x_2 & + & 3x_3 & - & 4x_4 & = & 0 \\ & & & & x_2 & - & x_3 & + & x_4 & = & 1 \\ x_1 & + & 3x_2 & & & - & 3x_4 & = & 7 \\ & - & 7x_2 & + & 3x_3 & + & x_4 & = & -15 \end{array}$$

3. Ispitati domenu i sve asimptote funkcije $g(x) = (\sqrt{x^2 - 5x + 1} - x)$. 5+15

4. Ispitati tok i nacrtati graf funkcije: $f(x) = \frac{5-x}{9-x^2}$. 20(graf)

5. Odrediti domenu, periodičnost, (ne)parnost i drugu derivaciju funkcije: $h(x) = \cos(4x)$. 2+5+4+9

Ukupno:

3.) $g(x) = (\sqrt{x^2 - 5x + 1} - x)$

$$x^2 - 5x + 1 \geq 0$$

$$x = \frac{5 \pm \sqrt{(-5)^2 - 4 \cdot 1 \cdot 1}}{2}$$

$$x = \frac{5 \pm \sqrt{25 - 4}}{2}$$

$$x = \frac{5 \pm \sqrt{21}}{2}$$

$$x_1 = \frac{5 - 4.58}{2}$$

$$x_1 = \frac{0.42}{2} = 0.21$$

$$x_2 = \frac{5 + 4.58}{2} = 4.79$$

$$D(g) = (-\infty, 0.21] \cup [4.79, +\infty)$$

MONOTON.

H.A.

$$\lim_{x \rightarrow +\infty} \sqrt{x^2 - 5x + 1} - x = \lim_{x \rightarrow +\infty} \sqrt{x^2 - 5x + 1} - x - \frac{\sqrt{x^2 - 5x + 1} + x}{\sqrt{x^2 - 5x + 1} + x} =$$

$$= \lim_{x \rightarrow +\infty} \frac{x^2 - 5x + 1 - x^2}{\sqrt{x^2 - 5x + 1} + x} = \lim_{x \rightarrow +\infty} \frac{-5x + 1}{\sqrt{x^2 - 5x + 1} + x} = \frac{-5}{2} + \frac{1}{2x} =$$

$$= -\frac{5}{2} \text{ D.H.A.}$$

15

C.H.A.

$$\lim_{x \rightarrow -\infty} \sqrt{x^2 - 5x + 1} = x = \lim_{x \rightarrow -\infty} \sqrt{-x^2 + 5x + 1} + x \cdot \frac{\sqrt{-x^2 + 5x + 1} - x}{\sqrt{-x^2 + 5x + 1} - x} = \frac{-x^2 + 5x + 1 - x^2}{\sqrt{-x^2 + 5x + 1} - x} =$$

$$= \frac{-x^2 + 5x + 1 - x^2}{\sqrt{-x^2 + 5x + 1} - x} = \frac{-2x^2 + 5x + 1}{\sqrt{-x^2 + 5x + 1} - x}$$

NEMA C.H.A.

NEMA KOSU A.



5.)

$$h(x) = \cos(4x)$$

$$h(x) = h(-x) \quad \text{w}$$

$$h'(x) = \cos(4x)$$

$$D(h) = \mathbb{R} \quad \text{w}$$

$$\cos(4x) = \cos(-4x) \quad \checkmark$$

$$h'(x) = -\sin(4x) \cdot 4$$

h(x) NIJE PERIODIČNA

FUNKCIJA JE PAKENA

$$h'(x) = -4 \sin(4x)$$

$$h''(x) = \cos(4x) \cdot 16 = 16 \cos(4x)$$

2.)

$$x_1 - 2x_2 + 3x_3 - 4x_4 = 0$$

$$x_2 - x_3 + x_4 = 1$$

$$x_1 + 3x_2 - 2x_3 = 7$$

$$-2x_2 + 3x_3 + x_4 = -15$$

$$\left[\begin{array}{cccc|c} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 1 & 3 & 0 & -3 & 7 \\ 0 & -2 & 3 & 1 & -15 \end{array} \right] \begin{array}{l} \\ \\ R3 - R1 \\ \\ \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 5 & -3 & 1 & 7 \\ 0 & -2 & 3 & 1 & -15 \end{array} \right] \begin{array}{l} R1 + 2R2 \\ \\ R3 - 5R2 \\ R4 + 2R2 \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 1 & -2 & 12 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 2 & -4 & 2 \\ 0 & 0 & -4 & 3 & -8 \end{array} \right] \begin{array}{l} \\ \\ R2 \cdot 2 \\ R4 + 2R3 \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 1 & -2 & 12 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & -4 & 3 & -8 \end{array} \right] \begin{array}{l} R1 - R3 \\ R2 + R3 \\ \\ R4 + 4R3 \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & 1 & 11 \\ 0 & 1 & 0 & -1 & 2 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 0 & -4 \end{array} \right]$$



NEMA RIJEŠENJA

3) $f(x) = \frac{5-x}{9-x^2}$

$D = \langle -3, 3 \rangle \cup \langle 3, +\infty \rangle$

7

$9-x^2 > 0$

$-x^2 > -9 \quad | \cdot (-1)$

$x^2 < 9$

$x < 3$

v.d.

$\lim_{x \rightarrow -3^-} \frac{5-x}{9-x^2} = \frac{8}{0} = +\infty$ 3) f.v.A. $\lim_{x \rightarrow -3^+} \frac{5-x}{9-x^2} = \frac{8}{0} = -\infty$ 3) f.v.A.

$\lim_{x \rightarrow 3^-} \frac{5-x}{9-x^2} = \frac{2}{0} = +\infty$

$\lim_{x \rightarrow 3^+} \frac{5-x}{9-x^2} = \frac{2}{0} = -\infty$

$\lim_{x \rightarrow 3^-} \frac{5-x}{9-x^2} = \frac{2}{0} = +\infty$

$\lim_{x \rightarrow 3^+} \frac{5-x}{9-x^2} = \frac{2}{0} = -\infty$

U.A.

$\lim_{x \rightarrow \infty} \frac{5-x}{9-x^2} = \lim_{x \rightarrow \infty} \frac{\frac{5}{x^2} - \frac{x}{x^2}}{\frac{9}{x^2} - \frac{x^2}{x^2}} = \frac{0}{1} = 0$ U.A. = 0

NEĆE IMA TI IMA H.A.

$\lim_{x \rightarrow -\infty} \frac{5-x}{9-x^2} = \lim_{x \rightarrow -\infty} \frac{5+x}{9-x^2} = \lim_{x \rightarrow -\infty} \frac{\frac{5}{x^2} + \frac{x}{x^2}}{\frac{9}{x^2} - \frac{x^2}{x^2}} = \frac{0}{1} = 0$ U.A. = 0

PROZOR

$f(x) = \frac{5-x}{9-x^2}$

$-2x^2 + 10x - 1 = 0$

$f'(x) = \frac{-1(9-x^2) - (5-x)(-2x)}{(9-x^2)^2}$

$f(x)$	$=$	$-$	$=$	$-$
$f'(x)$	\downarrow	\downarrow	\downarrow	\downarrow
	\uparrow	\uparrow	\uparrow	\uparrow

$f'(x) = \frac{-1+2x(5-x)}{9-x^2}$

$f(x) = \frac{-1+10x-x^2}{9-x^2}$

FUNKCIJA NIJE PERIODIČNA JER NEMA TRIG. FUNKCIJA

PROZOR

$f(x) = f(x)$

$f(x) = f(x)$

FUNKCIJA NIJE NI PARNA NI NEPARNA

$f(x) = \frac{-2x^2+10x-1}{9-x^2}$

$\frac{5-x}{9-x^2} = \frac{5-x}{9+x^2}$

$\frac{5-x}{9-x^2} = \frac{5+x}{9+x^2}$

GRAFIK \rightarrow

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj

odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod!!

IME I PREZIME: *Tibor Rak*

BROJ INDEKSA: *17-1-0060-2011*

VRIJEME POČETKA: *8:05*

VRIJEME ZAVRŠETKA:

POPUNJAVA

NASTAVNIK

Broj ↓

bodova

1. Odrediti kompleksne brojeve z koji zadovoljava jednadžbu $\frac{|z|}{2(z+i)} = 3i$.

20

2. Riješi sustav Gaussovom metodom:

20

$$\begin{array}{rccccrcr} x_1 & - & 2x_2 & + & 3x_3 & - & 4x_4 & = & 0 \\ & & x_2 & - & x_3 & + & x_4 & = & 1 \\ x_1 & + & 3x_2 & & & - & 3x_4 & = & 7 \\ & - & 7x_2 & + & 3x_3 & + & x_4 & = & -15 \end{array}$$

3. Ispitati domenu i sve asimptote funkcije $g(x) = (\sqrt{x^2 - 5x + 1} - x)$.

5+15

4. Ispitati tok i nacrtati graf funkcije: $f(x) = \frac{5-x}{9-x^2}$.

20(graf)

5. Odrediti domenu, periodičnost, (ne)parnost i drugu derivaciju funkcije: $h(x) = \cos(4x)$.

2+5+4+9

Ukupno:

5.

$$h(x) = \cos(4x)$$

$$h'(x) = (\cos(4x))' = -\sin 4x \cdot (4x)' = -\sin 4x \cdot 4$$

$$h''(x) = (-\sin 4x \cdot 4)' = (-\sin 4x)' \cdot 4 + (-\sin 4x) \cdot (4)'$$

$$h''(x) = \cos 4x \cdot 4$$

$$h(x) = \cos(4x)$$

$$D = \mathbb{R}$$

IME I PREZIME: Tibor Rale

BROJ INDEKSA: 17-1-0060-9011

$$2. \begin{bmatrix} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 1 & 3 & 0 & -3 & 7 \\ 0 & -7 & 3 & 1 & -15 \end{bmatrix} \xrightarrow{R3-R1} \approx \begin{bmatrix} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 5 & -3 & 1 & 7 \\ 0 & -7 & 3 & 1 & -15 \end{bmatrix} \xrightarrow{\begin{matrix} R1+2R2 \\ R3-3R2 \\ R4+7R2 \end{matrix}} \approx \begin{bmatrix} 1 & 0 & 1 & -2 & 2 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 3 & -6 & 4 \\ 0 & 0 & -4 & -20 & -8 \end{bmatrix} \xrightarrow{R3+2R2} \approx$$

$$\begin{bmatrix} 1 & 0 & 1 & -2 & 2 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 1 & -4 & 6 \\ 0 & 0 & -4 & -20 & -8 \end{bmatrix} \xrightarrow{\begin{matrix} R1-R3 \\ R2+R3 \\ R4+4R3 \end{matrix}} \approx \begin{bmatrix} 1 & 0 & 0 & 6 & -4 \\ 0 & 1 & 0 & -3 & 7 \\ 0 & 0 & 1 & -4 & 6 \\ 0 & 0 & 0 & -36 & 16 \end{bmatrix} \xrightarrow{R4 \cdot \left(-\frac{1}{36}\right)} \approx \begin{bmatrix} 1 & 0 & 0 & 6 & -4 \\ 0 & 1 & 0 & -3 & 7 \\ 0 & 0 & 1 & -4 & 6 \\ 0 & 0 & 0 & 1 & -\frac{16}{36} \end{bmatrix} \xrightarrow{\begin{matrix} R1-6R4 \\ R2+3R4 \\ R3+4R4 \end{matrix}} \approx$$

$$\begin{bmatrix} 1 & 0 & 0 & 0 & -\frac{4}{3} \\ 0 & 1 & 0 & 0 & \frac{17}{3} \\ 0 & 0 & 1 & 0 & \frac{38}{3} \\ 0 & 0 & 0 & 1 & -\frac{16}{36} \end{bmatrix} \Rightarrow \begin{pmatrix} -\frac{4}{3} \\ \frac{17}{3} \\ \frac{38}{3} \\ -\frac{16}{36} \end{pmatrix}$$

$$1. \frac{|z|}{2(z+i)} = 3i \quad | \cdot 2(z+i)$$

$$|z| = 3i \cdot 2(z+i)$$

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odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod!!

IME I PREZIME: *LUKA MUROVIĆ*

BROJ INDEKSA:

VRIJEME POČETKA:

VRIJEME ZAVRŠETKA:

POPUNJAVA
NASTAVNIK
Broj ↓
bodova



1. Odrediti kompleksne brojeve z koji zadovoljava jednadžbu $\frac{|z|}{2(z+i)} = 3i$. 20

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$$\begin{array}{ccccrc} x_1 & - & 2x_2 & + & 3x_3 & - & 4x_4 & = & 0 \\ & & & & x_2 & - & x_3 & + & x_4 & = & 1 \\ x_1 & + & 3x_2 & & & - & 3x_4 & = & 7 \\ & - & 7x_2 & + & 3x_3 & + & x_4 & = & -15 \end{array}$$

3. Ispitati domenu i sve asimptote funkcije $g(x) = (\sqrt{x^2 - 5x + 1} - x)$. 5+15

4. Ispitati tok i nacrtati graf funkcije: $f(x) = \frac{5-x}{9-x^2}$. 20(graf)

5. Odrediti domenu, periodičnost, (ne)parnost i drugu derivaciju funkcije: $h(x) = \cos(4x)$. 2+5+4+9

Ukupno:

1.)
$$\left(\begin{array}{cccc|c} 1 & -2 & +3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 1 & 3 & 0 & -3 & 7 \\ 0 & 7 & 3 & 1 & -15 \end{array} \right) \cdot (-1)$$

2.
$$\left(\begin{array}{cccc|c} 1 & -2 & +3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 5 & -3 & 1 & 7 \\ 0 & 7 & 3 & 1 & -15 \end{array} \right) \cdot (-5) \quad \cdot (-7)$$

3.
$$\left(\begin{array}{cccc|c} 1 & -2 & 3 & -4 & 0 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 2 & -4 & 2 \\ 0 & 0 & 10 & -6 & 22 \end{array} \right) \cdot 2$$

4.
$$\left(\begin{array}{cccc|c} 1 & 0 & 1 & -2 & 2 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 2 & -4 & 2 \\ 0 & 0 & 10 & -6 & 22 \end{array} \right) : 2$$

$x_1 = 1$
 $x_2 = 3,17$
 $x_3 = 2,34$
 $x_4 = 1,7$

IME I PREZIME:

LUKA MOROVIĆ

BROJ INDEKSA:

$$\left(\begin{array}{cccc|c} 1 & 0 & 1 & -2 & 2 \\ 0 & 1 & -1 & 1 & 1 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 10 & -6 & 22 \end{array} \right) \begin{array}{l} \leftarrow + \\ \leftarrow + \\ \cdot (-1) \cdot (-1) \end{array}$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 & 2 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 10 & -6 & 22 \end{array} \right) \begin{array}{l} \leftarrow \cdot (-10) \end{array}$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 & 2 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 14 & 12 \end{array} \right) \begin{array}{l} \leftarrow \\ \leftarrow \\ \leftarrow \\ \leftarrow \cdot (-14) \end{array}$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1 & 2 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 1 & 1.17 \end{array} \right) \begin{array}{l} \leftarrow + \\ \leftarrow + \\ \leftarrow \cdot (-1) \cdot (-2) \end{array}$$

$$\left(\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 3.17 \\ 0 & 0 & 1 & 0 & 2.34 \\ 0 & 0 & 0 & 1 & 1.17 \end{array} \right)$$

IME I PREZIME: LUKA MOROVIĆ

BROJ INDEKSA:

$$4.) f(x) = \left(\frac{5-x}{9-x^2} \right)'$$

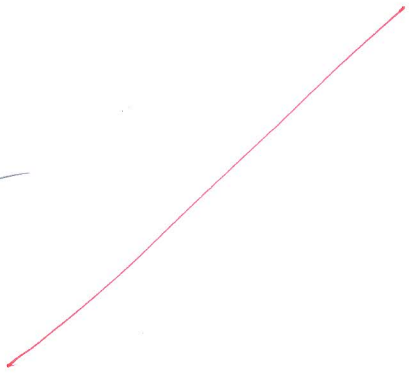
$$f'(x) = \frac{(5-x)' \cdot (9-x^2) - (5-x) \cdot (9-x^2)'}{(9-x^2)^2}$$

$$f'(x) = \frac{(5)' - (x)' \cdot (9-x^2) - (5-x) \cdot (9)' - (x^2)'}{(9-x^2)^2}$$

$$f'(x) = \frac{0 - 1 \cdot (9-x^2) - (5-x) \cdot (0-2x)}{(9-x^2)^2}$$

$$f'(x) = \frac{-9 + x^2 - 2x \cdot (5-x)}{(9-x^2)^2}$$

==



MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod!!

POPUNJAVA
NASTAVNIK
Broj ↓
bodova

IME I PREZIME: *IVAN BANOVAC*

BROJ INDEKSA: *17-1-0048-2010*

VRIJEME POČETKA: *07:40*

VRIJEME ZAVRŠETKA: *08:30*

2

1. Odrediti kompleksne brojeve z koji zadovoljava jednadžbu $\frac{|z|}{2(z+i)} = 3i$. 20

2. Riješi sustav Gaussovom metodom: 20

$$\begin{array}{rccccrcr} x_1 & - & 2x_2 & + & 3x_3 & - & 4x_4 & = & 0 \\ & & x_2 & - & x_3 & + & x_4 & = & 1 \\ x_1 & + & 3x_2 & & & - & 3x_4 & = & 7 \\ & - & 7x_2 & + & 3x_3 & + & x_4 & = & -15 \end{array}$$

3. Ispitati domenu i sve asimptote funkcije $g(x) = (\sqrt{x^2 - 5x + 1} - x)$. 5+15

4. Ispitati tok i nacrtati graf funkcije: $f(x) = \frac{5-x}{9-x^2}$. 20(graf)

5. Odrediti domenu, periodičnost, (ne)parnost i drugu derivaciju funkcije: $h(x) = \cos(4x)$. 2+5+4+9

Ukupno:

$$\begin{aligned} 3. \quad g(x) &= \sqrt{x^2 - 5x + 1} - x \\ \sqrt{x^2 - 5x + 1} &> 0 \\ x^2 - 5x + 1 &> 0 \end{aligned}$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{5 \pm \sqrt{(-5)^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1}$$

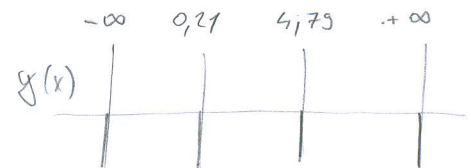
$$\frac{5 \pm \sqrt{21}}{2}$$

$$x_1 = \frac{5 + 4,58}{2}$$

$$x_1 = 4,79$$

$$x_2 = \frac{5 - 4,58}{2}$$

$$x_2 = 0,21$$



5. $h(x) = \cos(4x)$

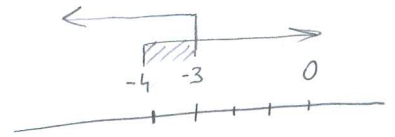
$$0 \leq 4x \leq 1$$

Domena $x \in \langle -4, -3 \rangle$

$$x \geq -4$$

$$4x \leq 1$$

$$x \leq -3$$



funkcija je periodična

$$h(x) = \cos(4x)$$

$$h'(x) = -\sin(4x) \cdot (4x)'$$

$$h'(x) = -4\sin(4x)$$

$$h''(x) = (-4)' \cdot \sin(4x) + (-4) \cdot \sin(4x)'$$

$$h''(x) = -4 \left(\cos(4x) \cdot (4x)' \right)$$

$$h''(x) = -4 \left(4\cos(4x) \right)$$

$$h''(x) = -16\cos(4x) //$$