MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod⇊ D3

IME I PREZIME: VINKO ŠPAR **BROJ INDEKSA:** 17-2-0054-2010

POPUNJAVA NASTAVNIK Broj ↓ bodova

1. Među kompleksnim brojevima odrediti rješenja jednadžbe $z^3 = -(i)^{935}$. *Prikazati rješenja u kompleksnoj ravnini!* — 12 / 15+5
2. Riješi sustav Gaussovom metodom i obavezno provjeri rješenje: — 15+5

$$\begin{aligned} 5x + 4z + 2t &= 3 \\ x - y + 2z + t &= 0 \\ 4x + y + 2z &= 1 \\ x + y + z + t &= -1 \end{aligned}$$

3. Za funkciju $f(x) = \dfrac{\cos(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. — 13+2
4. Za funkciju: $f(x) = \sqrt{x^2 - 3x + 6}$ treba:
   (a) pronaći drugu derivaciju — 10
   (b) na temelju ispitivanja toka funkcije skicirati graf — 20(graf)
5. Izračunati i obavezno uvrštavanjem provjeriti koliko iznosi $\lim\limits_{x \to -1} \left(\dfrac{\frac{\pi}{2} + \arcsin x}{x^2 - 1} \right)$. — 8+2

Ukupno: 27

(1) $z^3 = -(i)^{935} = -\left(i^{233 \cdot 4 + 3}\right) = -(1 \cdot i^3) = -(-i) = i$

$z^3 = i \qquad z = \sqrt[3]{i}$

$w = i \Rightarrow \quad x = \operatorname{Re} w = 0 \quad \Rightarrow r = |w| = \sqrt{x^2 + y^2} = 1$

$y = \operatorname{Im} w = 1 \qquad \operatorname{tg} t = \frac{y}{x} = \frac{1}{0} = \infty \Rightarrow t = \frac{\pi}{2}$ ✓

$n = 3 \Rightarrow \quad k = 0, 1, 2$

$\sqrt[n]{w} = \sqrt[n]{r}\left(\cos\frac{t + 2\pi k}{n} + i \cdot \sin\frac{t + 2\pi k}{n}\right), \; k = 0, 1, 2, \ldots, (n-1)$

1) $k = 0: \; z_1 = \sqrt[3]{1}\left(\cos\frac{\frac{\pi}{2} + 2\pi \cdot 0}{3} + i \cdot \sin\frac{\frac{\pi}{2} + 2\pi \cdot 0}{3}\right) =$

$= \cos\frac{\pi}{6} + i \cdot \sin\frac{\pi}{6} =$ IZRAČUNATI

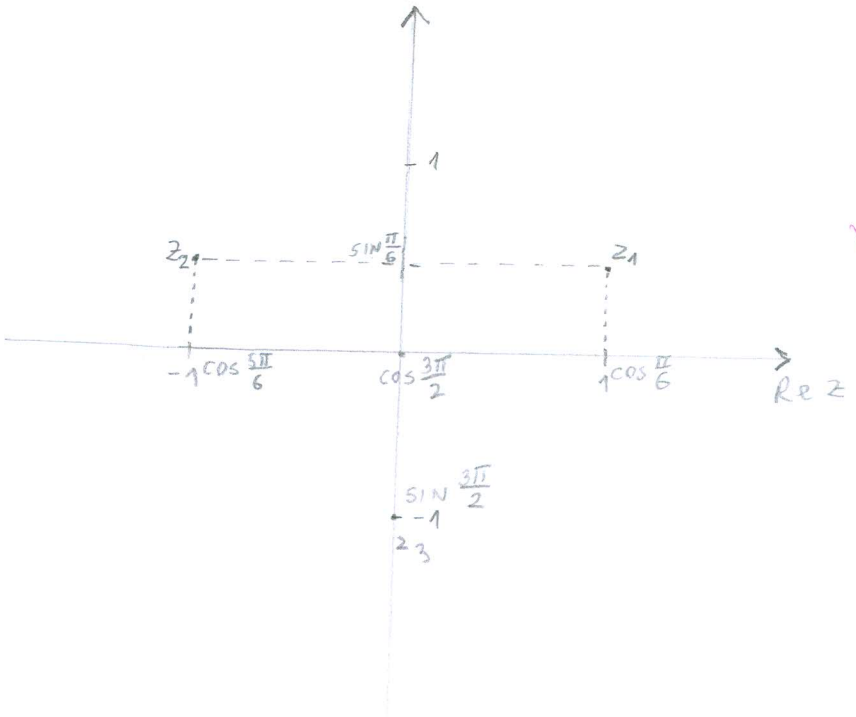
2) $k = 1: \; z_2 = \sqrt[3]{1}\left(\cos\frac{\frac{\pi}{2} + 2\pi \cdot 1}{3} + i \cdot \sin\frac{\frac{\pi}{2} + 2\pi \cdot 1}{3}\right) =$

$= \cos\frac{5\pi}{6} + i \cdot \sin\frac{5\pi}{6} =$

3) $k = 2: \; z_3 = \sqrt[3]{1}\left(\cos\frac{\frac{\pi}{2} + 2\pi \cdot 2}{3} + i \cdot \sin\frac{\frac{\pi}{2} + 2\pi \cdot 2}{3}\right) =$

$= \cos\frac{3\pi}{2} + i \cdot \sin\frac{3\pi}{2} =$

Im ↑



✓

② $\begin{cases} 5x+4z+2t=3 \\ x-y+2z+t=0 \\ 4x+y+2z=1 \\ x+y+z+t=-1 \end{cases}$

$$\begin{bmatrix} 5 & 0 & 4 & 2 & | & 3 \\ 1 & -1 & 2 & 1 & | & 0 \\ 4 & 1 & 2 & 0 & | & 1 \\ 1 & 1 & 1 & 1 & | & -1 \end{bmatrix} \leftrightarrow =$$

$$= \begin{bmatrix} 1 & 1 & 1 & 1 & | & -1 \\ 1 & -2 & 2 & 1 & | & 0 \\ 4 & 1 & 2 & 0 & | & 1 \\ 5 & 0 & 4 & 2 & | & 3 \end{bmatrix} \begin{matrix} /\cdot(-1) \\ /\cdot(-4) \\ /\cdot(-5) \end{matrix} =$$

$$= \begin{bmatrix} 1 & 1 & 1 & 1 & | & -1 \\ 0 & -2 & 1 & 0 & | & 1 \\ 0 & -3 & -2 & -4 & | & 5 \\ 0 & -5 & -1 & -3 & | & 8 \end{bmatrix} 1\cdot(-\tfrac{1}{2}) \quad \begin{bmatrix} 1 & 1 & 1 & 1 & | & -1 \\ 0 & 1 & -\frac{1}{2} & 0 & | & -\frac{1}{2} \\ 0 & -3 & -2 & -4 & | & 5 \\ 0 & -5 & -1 & -3 & | & 8 \end{bmatrix} /\cdot(-1) \; /\cdot 3 \; /\cdot 5 =$$

$$= \begin{bmatrix} 1 & 0 & \frac{3}{2} & 1 & | & -\frac{1}{2} \\ 0 & 1 & -\frac{1}{2} & 0 & | & -\frac{1}{2} \\ 0 & 0 & -\frac{7}{2} & -4 & | & \frac{7}{2} \\ 0 & 0 & -\frac{7}{2} & -3 & | & \frac{11}{2} \end{bmatrix} /\cdot\tfrac{-2}{7} = \begin{bmatrix} 1 & 0 & \frac{3}{2} & 1 & | & -\frac{1}{2} \\ 0 & 1 & -\frac{1}{2} & 0 & | & -\frac{1}{2} \\ 0 & 0 & 1 & \frac{8}{7} & | & -1 \\ 0 & 0 & -\frac{7}{2} & -3 & | & \frac{11}{2} \end{bmatrix} 1\cdot(-\tfrac{3}{2}) \; /\cdot\tfrac{1}{2} \; /\cdot\tfrac{7}{2} =$$

$$= \begin{bmatrix} 1 & 0 & 0 & -\frac{5}{7} & | & 1 \\ 0 & 1 & 0 & \frac{4}{7} & | & -1 \\ 0 & 0 & 1 & \frac{8}{7} & | & -1 \\ 0 & 0 & 0 & 1 & | & 2 \end{bmatrix} /\cdot\tfrac{-8}{7} \; /\cdot\tfrac{-4}{7} \; /\cdot\tfrac{5}{7}$$

$$= \begin{bmatrix} 1 & 0 & 0 & 0 & | & \frac{19}{7} \\ 0 & 1 & 0 & 0 & | & -\frac{15}{7} \\ 0 & 0 & 1 & 0 & | & -\frac{23}{7} \\ 0 & 0 & 0 & 1 & | & 2 \end{bmatrix}$$

$\Rightarrow x = \frac{19}{7} \quad y = \frac{-15}{7} \quad z = \frac{-23}{7}$

$t = 2$

✓

VINKO SPAR

② PROVJERA

$5x+4z+2t=3$

$5\cdot\frac{17}{7}+4\cdot\frac{-23}{7}+2\cdot 2=3$

$\frac{85}{7}+\frac{-92}{7}+4=3$

$3=3$ ✓

$x-y+2z+t=0$

$\frac{17}{7}-\left(\frac{-15}{7}\right)+2\cdot\frac{-23}{7}+2=0$

$-\frac{32}{7}+\frac{-46}{7}+2=0$

$-\frac{14}{7}+2=0$

$-2+2=0$

$0=0$ ✓

$4x+y+2z=1$

$4\cdot\frac{17}{7}+\frac{-15}{7}+2\cdot\frac{-23}{7}=1$

$9.7+\frac{-15}{7}+(-6.6)=1$

$9.7-2.1-6.6=1$

$7.6-6.6=1$

$1=1$ ✓

$x+y+z+t=-1$

$\frac{17}{7}+\frac{-15}{7}+\frac{-23}{7}+2=-1$

$\frac{2}{7}+\frac{-23}{7}+2=-1$

$-\frac{21}{7}+2=-1$

$-3+2=-1$

$-1=-1$ ✓

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod⇊ D3

IME I PREZIME: GORDAN JAČAN **BROJ INDEKSA:** 0269086532

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Među kompleksnim brojevima odrediti rješenja jednadžbe $z^3 = -(i)^{935}$. *Prikazati rješenja u kompleksnoj ravnini!* 15+5

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3. Za funkciju $f(x) = \dfrac{\cos(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 13+2

4. Za funkciju: $f(x) = \sqrt{x^2 - 3x + 6}$ treba:
   (a) pronaći drugu derivaciju 10
   (b) na temelju ispitivanja toka funkcije skicirati graf 20(graf)

5. Izračunati i obavezno uvrštavanjem provjeriti koliko iznosi $\lim\limits_{x \to -1} \left(\dfrac{\frac{\pi}{2} + \arcsin x}{x^2 - 1} \right)$. 8+2

Ukupno: 12

3. $f(x) = \dfrac{\cos(2x)}{x}$

$f(\pi) = \dfrac{\cos(2\pi)}{\pi}$ ×

$f'(\pi) = \dfrac{-\sin(2\pi)}{0}$

5. $\lim\limits_{x \to -1} \left(\dfrac{\frac{\pi}{2} + \arcsin x}{x^2 - 1} \right) = \dfrac{\frac{\pi}{2} - \arcsin 1}{1 - 1} = \dfrac{0}{0} = 0$ ×

Ime i prezime: GORDAN JAĆAN **Broj indeksa:** 0269 086 592

2.

$$\left[\begin{array}{cccc|c} 5 & 0 & 4 & 2 & 3 \\ 1 & -1 & 2 & 1 & 0 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & -1 \end{array}\right] \sim \left[\begin{array}{cccc|c} \textcircled{1} & -1 & 2 & 1 & 0 \\ 5 & 0 & 4 & 2 & 3 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & -1 \end{array}\right] \begin{array}{l} \\ \cdot(-5) \\ \cdot(-4) \\ \cdot(-1) \end{array} \sim$$

$$\sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & \textcircled{5} & -6 & -3 & 3 \\ 0 & 5 & -6 & -4 & 1 \\ 0 & 2 & -1 & 0 & -1 \end{array}\right] \begin{array}{l} \\ \cdot(-1) \\ + \\ \\ \end{array} \sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & 5 & -6 & -3 & 3 \\ 0 & 0 & 0 & -1 & -2 \\ 0 & 2 & -1 & 0 & -1 \end{array}\right] \begin{array}{l} \\ \\ \cdot(-1) \\ \cdot(-1) \end{array} \sim$$

$$\sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & 5 & -6 & -3 & 3 \\ 0 & 0 & 0 & 1 & 2 \\ 0 & -2 & 1 & 0 & -1 \end{array}\right] \sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & 5 & -6 & -3 & 3 \\ 0 & -2 & 1 & 0 & -1 \\ 0 & 0 & 0 & 1 & 2 \end{array}\right] \begin{array}{l} \\ :5 \\ \\ \\ \end{array} \sim$$

$$\sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & \textcircled{1} & -\frac{6}{5} & -\frac{3}{5} & \frac{3}{5} \\ 0 & -2 & 1 & 0 & -1 \\ 0 & 0 & 0 & 1 & 2 \end{array}\right] \begin{array}{l} \\ \cdot 2 \\ + \\ \\ \end{array} \sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & 1 & -\frac{6}{5} & -\frac{3}{5} & \frac{3}{5} \\ 0 & 0 & -\frac{7}{5} & -\frac{6}{5} & \frac{1}{5} \\ 0 & 0 & 0 & 1 & 2 \end{array}\right] \begin{array}{l} \\ \\ \cdot(-5) \\ \\ \end{array} \sim$$

$$\sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 0 \\ 0 & 1 & -\frac{6}{5} & -\frac{3}{5} & \frac{3}{5} \\ 0 & 0 & 7 & 6 & -1 \\ 0 & 0 & 0 & \textcircled{1} & 2 \end{array}\right] \begin{array}{l} \\ \\ \\ \cdot(-6) \cdot \frac{5}{3} \cdot(-1) \end{array} \sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 0 & 0 \\ 0 & 1 & -\frac{6}{5} & 0 & 0 \\ 0 & 0 & 7 & 0 & -13 \\ 0 & 0 & 0 & 1 & 2 \end{array}\right] \begin{array}{l} \\ \\ :7 \\ \\ \end{array} \sim$$

GORDAN SAZAS 0265 086 552

2.

$$\sim \begin{bmatrix} 1 & -1 & 2 & 0 & 0 \\ 0 & 1 & -\frac{6}{5} & 0 & 0 \\ 0 & 0 & \textcircled{1} & 0 & -\frac{13}{7} \\ 0 & 0 & 0 & 1 & 2 \end{bmatrix} \cdot \frac{5}{6} \cdot (-2) \cdot (+) \sim \begin{bmatrix} 1 & -1 & 0 & 0 & \frac{26}{7} \\ 0 & \textcircled{1} & 0 & 0 & \frac{65}{42} \\ 0 & 0 & 1 & 0 & -\frac{13}{7} \\ 0 & 0 & 0 & 1 & 2 \end{bmatrix} \cdot (+)$$

$$\begin{bmatrix} 1 & 0 & 0 & 0 & \frac{221}{42} \\ 0 & 1 & 0 & 0 & \frac{65}{42} \\ 0 & 0 & 1 & 0 & -\frac{13}{7} \\ 0 & 0 & 0 & 1 & 2 \end{bmatrix}$$

$t = 2$ $\quad x = \frac{221}{42}$

$z = -\frac{13}{7}$ $\quad y = \frac{65}{42}$

K. A.

$y = kx + l$ $\qquad l = \lim_{x\to\infty} [f(x) - kx]$

$k = \lim_{x\to\infty} \frac{f(x)}{x}$

$k = \lim_{x\to\infty} \frac{\sqrt{x^2-3x+6}\ /:x}{x\ /:x} = \lim_{x\to\infty} \frac{\sqrt{1-\frac{3}{x}+\frac{6}{x^2}}}{1} = 1$

$l = \lim_{x\to\infty} \sqrt{x^2-3x+6} - x \cdot \frac{\sqrt{x^2-3x+6}+x}{\sqrt{x^2-3x+6}+x} = \lim_{x\to\infty} \frac{x^2-3x+6-x^2\ /:x}{\sqrt{x^2-3x+6}+x\ /:x} =$

$= \lim_{x\to\infty} \frac{-3+\frac{6}{x}}{\sqrt{1-\frac{3}{x}+\frac{6}{x^2}}+1} = -\frac{3}{2}$

$y = x - \frac{3}{2}$ ← D. K. A

L. K. A. $\frac{?}{\infty}$

KRITIČNE TOČKE

$f'(x) = 0$

$\frac{2x-3}{2\sqrt{x^2-3x+6}} = 0$

$2x - 3 = 0$ $\qquad 2\sqrt{x^2-3x+6} = 0\ /^2$

$x_1 = \frac{3}{2}$ $\qquad 4x^2 - 12x + 24 = 0\ /:4$

$x^2 - 3x + 6 = 0$

$x_{2,3} = \frac{3 \pm \sqrt{9-24}}{2}$

MONOTONOST

	$-\infty$		$\frac{3}{2}$		∞
$f'(x)$		−		+	
$f(x)$		↘		↗	

GORDAN JAĆAN 0269 086 592

4. $f(x) = \sqrt{x^2 - 3x + 6}$

a) $f'(x) = \frac{1}{2\sqrt{x^2-3x+6}} \cdot (2x-3)$ ✓

$$f'(x) = \frac{2x-3}{2\sqrt{x^2-3x+6}}$$

$$f''(x) = \frac{(2x-3)' \cdot 2\sqrt{x^2-3x+6} - (2x-3) \cdot \left(2\sqrt{x^2-3x+6}\right)'}{\left(2\sqrt{x^2-3x+6}\right)^2}$$

$$f''(x) = \frac{4\sqrt{x^2-3x+6} - (2x-3) \cdot \frac{1}{4\sqrt{x^2-3x+6}} \cdot (2x-3)}{\left(2\sqrt{x^2-3x+6}\right)^2} \quad (2x-3)^2$$ ✗

$$f''(x) = \frac{4\sqrt{x^2-3x+6} - 4x^2 - 12x + 9 \cdot \left(4\sqrt{x^2-3x+6}\right)^{-1}}{\left(2\sqrt{x^2-3x+6}\right)^2}$$

b) DOMENA

$x^2 - 3x + 6 \geq 0$ $\quad Df = \mathbb{R}$

$x_{1,2} = \frac{3 \pm \sqrt{9-24}}{2}$

$x_{1,2} = \frac{3 \pm \sqrt{-15}}{2}$

ASIMPTOTE

V.A. nema jer je $Df = \mathbb{R}$

L. H. A.

$$\lim_{x \to -\infty} \sqrt{x^2-3x+6} \cdot \frac{-\sqrt{x^2-3x+6}}{-\sqrt{x^2-3x+6}} = \lim_{x \to -\infty} \frac{x^2-3x+6 \;/ : x^2}{-\sqrt{x^2-3x+6} \;/ : x^2} = \lim_{x \to -\infty} \frac{1 - \frac{3}{x} + \frac{6}{x^2}}{-\sqrt{\frac{1}{x^2} - \frac{3}{x^3} + \frac{6}{x^4}}} = \frac{1}{0}$$

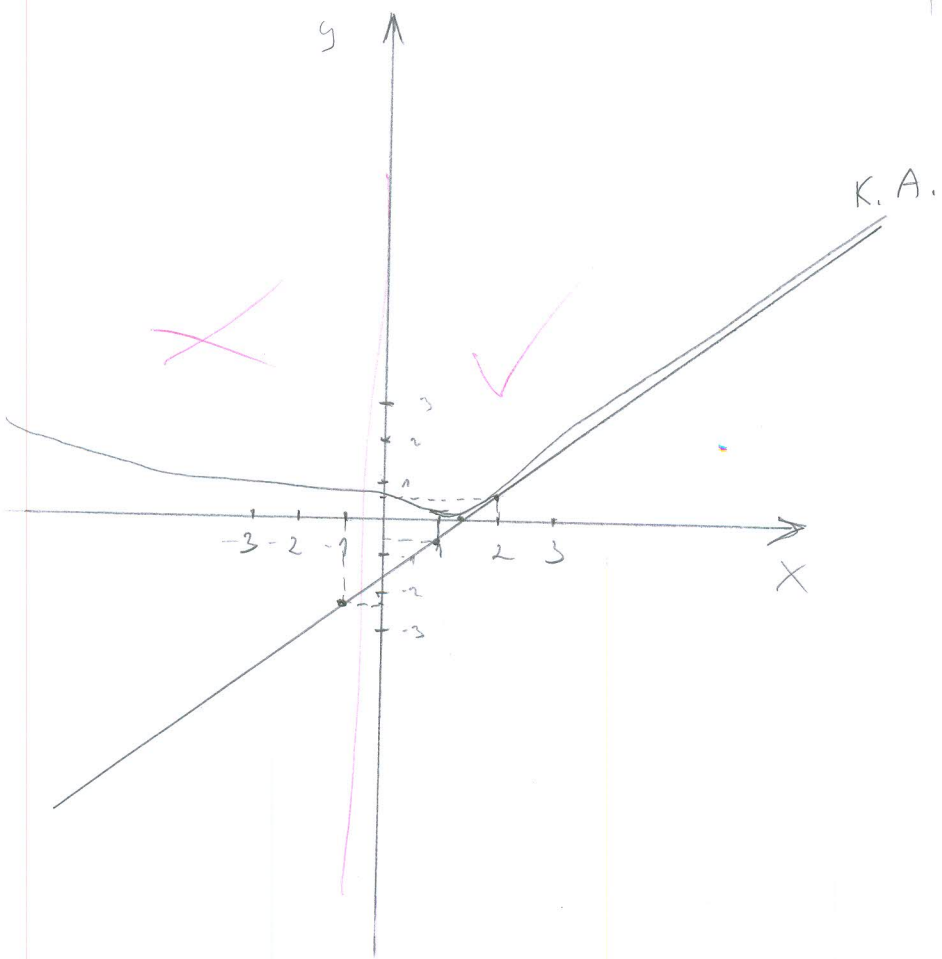
nema H. A.

(ne) PARNOST

$$f(-x) = \sqrt{(-x)^2 - 3\cdot(-x) + 6} = \sqrt{x + 3 + 6} = -\sqrt{x - 3 - 6}$$

ni parna ni neparna

y	$-\frac{1}{2}$	$\frac{11}{2}$	$-\frac{5}{2}$
x	1	2	−1



JAČAN

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IME I PREZIME: LOURE KAŠTROPIL **BROJ INDEKSA:** 0269086961

17-1-0255-2014

POPUNJAVA NASTAVNIK Broj ↓ bodova

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Ukupno: 15

2)

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$$\left[\begin{array}{cccc|c} 5 & 0 & 4 & 2 & 3 \\ 1 & -1 & 2 & 1 & 0 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & -1 \end{array}\right]$$

$$\left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 1 & -1 & 2 & 1 & 0 \\ 4 & 1 & 2 & 0 & 1 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right] \cdot 2 \leftarrow$$

$$\left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 3 & 1 & 4 & 3 & -2 \\ 4 & 1 & 2 & 0 & 1 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right] \cdot (-3) \leftarrow$$

$$\left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & -2 & 1 & 0 & -5 \\ 4 & 1 & 2 & 0 & 1 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right] \cdot (-4) \leftarrow$$

$$\left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & -2 & 1 & 0 & -5 \\ 0 & -3 & -2 & -4 & -4 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right]$$

Nema Rješenja.

IME I PREZIME: LOVRE KAŠTROPIL

BROJ INDEKSA: 0269086561

17-1-0255-2014

3) $f(x) = \frac{\cos(2x)}{x}$, $f'(\pi)$

$$f'(x) = \frac{(-\sin 2x \cdot 2 \cdot x) - ((\cos 2x) \cdot 1)}{x^2}$$

$$f'(x) = \frac{-2x \cdot \sin 2x - \cos 2x}{x^2}$$

$$f'(\pi) = \frac{-2\pi \cdot \sin 2\pi - \cos 2\pi}{\pi^2} =$$

$f'(\pi) = -0,101$ //

4) $f(x) = \sqrt{x^2-3x+6}$

a) $f'(x) \quad \frac{1}{2\sqrt{x^2-3x+6}} \cdot 2x-3$

$= \frac{2x-3}{2\sqrt{x^2-3x+6}}$

b) Domena $= \langle -\infty, +\infty \rangle$ NEMA V.A.

NEMA K.A.

$\lim_{x \to \pm\infty} = \sqrt{x^2-3x+6} \,/:x$

H.A. $\lim_{x \to \pm\infty} = \sqrt{\frac{x^2}{x^2} - \frac{3x}{x^2} + \frac{6}{x^2}} = \sqrt{1-0+0} = \sqrt{1} = \pm 1$

IME I PREZIME: LOURE KAŠTROPIL

BROJ INDEKSA: 0269086961
17-1-0255-2014

① $z^3 = -(i)^{935}$ $\quad i^{935} = i^3 = -i$

$z^3 = i$

$tg\varphi = \frac{y}{x} = \frac{-1}{0}$ $\quad z = r(\cos\varphi + i\sin\varphi)$

$r = \sqrt{x^2+y^2}$

$r = \sqrt{1}$

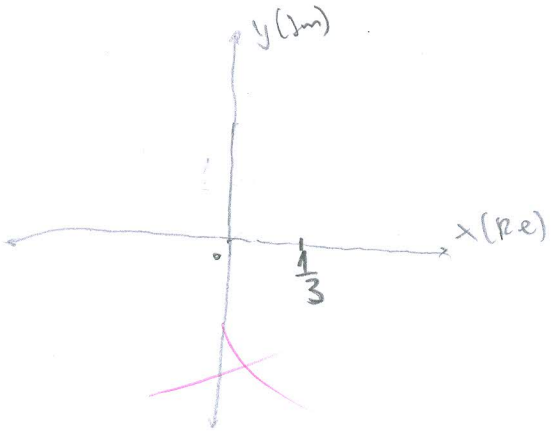
$r = 1$

$\varphi = 0$ $\quad z = 1(\cos 0 + i\sin 0)$

$k=0,\ w_1 = \sqrt[3]{1} \cdot \left(\frac{\cos 0 + 0\cdot 2\pi + i\sin 0 + 0}{3}\right) = 1 \cdot \frac{\cos 0 + i\sin 0}{3} \Rightarrow Re = 0 \quad Im = 0$

$k=1,\ w_2 = 1 \cdot \left(\frac{\cos 0 + 2\pi + i\sin 0 + 2\pi}{3}\right) = 1 \cdot \frac{\cos 2\pi + i\sin 2\pi}{3} \Rightarrow Re = \frac{1}{3} \quad Im = 0$

$k=2,\ w_3 = 1 \cdot \left(\frac{\cos 0 + 2\cdot 2\pi + i\sin + 2\cdot 2\pi}{3}\right) = 1 \cdot \frac{\cos 4\pi + i\sin 4\pi}{3} \Rightarrow Re = \frac{1}{3} \quad Im = 0$



③ $f(x) = \cos(2x)$, $f'(\pi)$

$f'(x) = -\sin 2 = -0{,}909$

$f'(\pi) = \frac{-\sin 2}{\pi} = -0{,}29$ //

$\cos(2x) = -\sin(2x)$

$-\sin(2 \cdot x) = -\sin 2$

⑤

$$\lim_{x \to -1} \left(\frac{\frac{\pi}{2} + \arcsin x}{x^2 - 1} \right) = \left(\frac{\frac{\pi}{2} + \arcsin(-1)}{(-1)^2 - 1} \right) = \frac{0}{0} = 0 \; //$$ ✗

Proširena: $\frac{\frac{\pi}{2} + \arcsin x}{0} = \frac{\pi/2}{-1} = \frac{-\pi}{2}$ //

④ $f(x) = \sqrt{x^2 \cdot 2 \cdot x + 6}$

$f'(x) = \sqrt{2 \cdot x' \cdot x^2 + 0}$

$f'(x) = \sqrt{2} x - 3$

$f''(x) = \sqrt{2} \cdot 1 - 0$

$f''(x) = \sqrt{2}$ ✓

⑤ $\lim_{x \to -1} \left(\frac{\frac{\pi}{2} + \arcsin x}{x^2 - 1} \right) =$ ✓

$\lim_{x \to (-1)^-} \left(\frac{\frac{\pi}{2} + \arcsin(-0{,}99999)}{(-0{,}99999)^2 - 1} \right) = -\infty$ ✗

$\lim_{x \to (-1)^+} \left(\frac{\frac{\pi}{2} + \arcsin(-1{,}00001)}{1{,}00001^2 - 1} \right) =$ Nema def.

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IME I PREZIME: Hrvoje Dijan **BROJ INDEKSA:**

POPUNJAVA NASTAVNIK Broj ↓ bodova

1. Među kompleksnim brojevima odrediti rješenja jednadžbe $z^3 = -(i)^{935}$. *Prikazati rješenja u kompleksnoj ravnini!* 15+5

2. Riješi sustav Gaussovom metodom i obavezno provjeri rješenje: 15+5

$$\begin{aligned} 5x + 4z + 2t &= 3 \\ x - y + 2z + t &= 0 \\ 4x + y + 2z &= 1 \\ x + y + z + t &= -1 \end{aligned}$$

3. Za funkciju $f(x) = \dfrac{\cos(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 13+2

4. Za funkciju: $f(x) = \sqrt{x^2 - 3x + 6}$ treba:

   (a) pronaći drugu derivaciju 10

   (b) na temelju ispitivanja toka funkcije skicirati graf 20(graf)

5. Izračunati i obavezno uvrštavanjem provjeriti koliko iznosi $\lim\limits_{x \to -1} \left(\dfrac{\frac{\pi}{2} + \arcsin x}{x^2 - 1} \right)$. 8+2

Ukupno: 0

2) $\left|\begin{array}{cccc|c} 5 & 0 & 4 & 2 & 3 \\ 1 & -1 & 2 & 1 & 0 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & -1 \end{array}\right| \sim \left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 1 & -1 & 2 & 1 & 0 \\ 4 & 1 & 2 & 0 & 1 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right| \begin{array}{l} \\ -I \\ -IV\,I \\ -V\,I \end{array}$

$\sim \left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & -2 & 1 & 0 & -1 \\ 0 & -3 & -2 & -4 & 5 \\ 0 & -5 & -1 & -3 & 8 \end{array}\right| \begin{array}{l} \\ :-2 \\ \sim \\ \\ \end{array} \left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & 1 & -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & -3 & -2 & -4 & 5 \\ 0 & -5 & -1 & -3 & 8 \end{array}\right| \begin{array}{l} \\ \\ +3\,II \\ +5\,II \end{array} \sim \left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & 1 & -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 0 & -\frac{7}{2} & -\frac{11}{2} & \frac{7}{2} \\ 0 & 0 & -\frac{7}{2} & -\frac{11}{2} & \frac{11}{2} \end{array}\right| \begin{array}{l} \\ \\ :\frac{7}{2} \\ :\frac{11}{2} \end{array}$

$\left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & 1 & -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 0 & 7 & 11 & -7 \\ 0 & 0 & 7 & 11 & -11 \end{array}\right| \begin{array}{l} \\ \\ \\ -III \end{array} \sim \left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & 1 & -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 0 & 7 & 11 & -7 \\ 0 & 0 & 0 & 0 & -3 \end{array}\right| \begin{array}{l} \\ \\ :7 \\ \\ \end{array} \sim \left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & -1 \\ 0 & 1 & -\frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{11}{7} & -1 \\ 0 & 0 & 0 & 0 & -3 \end{array}\right|$

4) $f(x) = \sqrt{x^2-3x+6}$

$$f'(x) = \frac{1}{2\sqrt{x^2-3x+6}} \cdot 2x-3 = \frac{2x-3}{2\sqrt{x^2-3x+6}}$$

$2\sqrt{x^2-3x+6} =$

$= 2(x^2-3x+6)^{\frac{1}{2}}$

$= \frac{3}{2}(x^2-3x+6)$

$$f''(x) = \frac{2 \cdot \left(\frac{3}{2}(x^2-3x+6)^{\frac{1}{2}}\right) - (2x-3)\cdot\left(\frac{3}{4}(x^2-3x+6)\right)\cdot(2x-3)}{\left(\frac{3}{2}(x^2-3x+6)^{\frac{1}{2}}\right)^2}$$

5) $f(x) = \frac{\cos 2x}{x}$

$f'(\pi)$?

$$f'(x) = \frac{-\sin 2x \cdot 2 - \cos 2x \cdot 1}{x^2} = \frac{-\sin^2 x}{x^2}$$

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod⇊ D3

IME I PREZIME: ROKO VLAKIĆ **BROJ INDEKSA:** 0269092698

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Ukupno:

0

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$$\left|\begin{array}{cccc} 5 & 0 & 4 & 2 \\ 1 & -1 & 2 & 1 \\ 4 & 1 & 2 & 0 \\ 1 & 1 & 1 & 1 \end{array}\right| \left|\begin{array}{c} 3 \\ 0 \\ 1 \\ -1 \end{array}\right| \rightarrow 1r-3r$$

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

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IME I PREZIME: LUCIJA IVANDIĆ

BROJ INDEKSA: 17-2-0109-2011

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