MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod ⇊ B8

IME I PREZIME: LUKA KNEŽEVIĆ **BROJ INDEKSA:** 17-2-1120-2014

ZAOKRUŽITI AKO ŽELITE: (ustmeni kod prof. Uglešića)

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Izračunaj sve kompleksne brojeve z takve da $\left|\frac{z}{2}\right|^2 = z + 1 + i$. *Prikaži ih u kompleksnoj ravnini!* 10+5

2. Riješiti sustav 4 jednadžbe s 4 nepoznanice $\begin{matrix} 5x+4z+2t=3 \\ x-y+2z+t=1 \\ 4x+y+2z=1 \\ x+y+z+t=0 \end{matrix}$ i obavezno provjeri rješenje: 10+5

3. Za funkciju $f(x) = \frac{\sin(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 8+2

4. Za funkciju: $g(x) = \sqrt{x^2+8x+5}$ treba:
   (a) ispitati domenu 5
   (b) pronaći lokalne ekstreme 11
   (c) ispitati asimptote 14 10

5. Na temelju ispitivanja toka skicirati graf funkcije e $h(x) = \frac{x^2+8}{x-8}$ 20 (graf): 7

6. Izračunati i obavezno na neki način provjeriti koliko iznosi $\lim_{x\to -1}\left(\frac{\sqrt{x^2-8x+7}-3+x}{x^2+4x+3}\right)$. 8+2

Ukupno: 47

3. $f(x) = \frac{\sin 2x}{x}$

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

$= \frac{2x\cos 2x - \sin 2x}{x^2}$

$f'(\pi) = \frac{2\pi}{\pi^2} = 0.63662$ ✓

4. $\sqrt{x^2+8x+5}$

a) $x^2+8x+5 \geq 0$

$x^2+8x+5=0$

$x = \frac{-8 \pm \sqrt{64-20}}{2} = \frac{-8 \pm \sqrt{44}}{2} = \frac{-8 \pm 2\sqrt{11}}{2} = -4 \pm \sqrt{11}$

$x_1 = -7.3166 \quad x_2 = -0.68$

$-7.316^2 + 8 \cdot -7.316 + 5 = 53.5 - 58.5 + 5 = 0$

$-0.68^2 - 8 \cdot 0.68 + 5 = 0.46 - 5.44 + 5 = 0$

x	$-\infty$		-7.3166		-0.68		$+\infty$
$f(x)$		+	N/D			+	

$Df = \langle -\infty, -7.3166] \cup [-0.68, +\infty\rangle$ ✓

b)

x	$-\infty$		-8		-7.3166		-0.68		0		$+\infty$
$f'(x)$		−		+	N/D			+			

LOKALNI MINIMUM

$f(x) = \sqrt{x^2+8x+5} = (x^2+8x+5)^{\frac{1}{2}}$

$f'(x) = \frac{1}{2}(x^2+8x+5)^{-\frac{1}{2}}(2x+8)$

$f'(x) = \frac{\frac{1}{2}(2x+8)}{\sqrt{x^2+8x+5}} = \frac{x+4}{\sqrt{x^2+8x+5}}$

$x+4=0$

$x=-4$ NIJE U DOMENI

$f(-8) = \sqrt{5} = 2.23$ LOKALNI MINIMUM

IMA LOKALNOG MAKSIMUMA

NEMA NI MINIMUM NI MAKSIMUM

RASTE ZA $x \in \langle -\infty, -7.3166]$

RASTE ZA $x \in [-0.68, +\infty\rangle$

c) $\lim_{x \to -7.3166^+} \sqrt{x^2+8x+5} = \sqrt{x^2+8x+5} \cdot \frac{\sqrt{x^2+8x+5}}{\sqrt{x^2+8x+5}} = \frac{x^2+8x+5}{\sqrt{x^2+8x+5}} = \frac{0^-}{\sqrt{-0}}$ NEMA REŠENJA

$\lim_{x \to -7.3166^-} \sqrt{x^2+8x+5} = \sqrt{x^2+8x+5} \cdot \frac{\sqrt{x^2+8x+5}}{\sqrt{x^2+8x+5}} = \frac{x^2+8x+5}{\sqrt{x^2+8x+5}} = \frac{0^+}{0^+} = +\infty$

$\lim_{x \to -0.68^+} \sqrt{x^2+8x+5} = \lim_{x \to -0.68} \sqrt{x^2+8x+5} \cdot \frac{\sqrt{x^2+8x+5}}{\sqrt{x^2+8x+5}} = \frac{x^2+8x+5}{\sqrt{x^2+8x+5}} = \frac{0^-}{\sqrt{-0}}$ NEMA REŠENJA

$\lim_{x \to -0.68^-} \sqrt{x^2+8x+5} = \lim_{x \to -0.68} \frac{x^2+8x+5}{\sqrt{x^2+8x+5}} = \frac{0^-}{\sqrt{-0}}$ NEMA REŠENJA

$-7.30^2 = 53.29$
$8 \cdot 7.30 = 58.4$
$8 \cdot 7.35 = 58.8$
$7.35^2 = 54.0225$
$-0.6^2 = -0.36$
$-0.7^2 = -0.49$
$8 \cdot 0.6 = -4.8$
$8 : 0 = -5.6$
$\frac{2.48}{0^+} = +\infty$

$x = -7.3166$ L.V.A ✗ $x = -0.68$ D.V.A ✗

H.A.

$\lim_{x \to +\infty} \sqrt{x^2+8x+5} = \lim_{x \to +\infty} \sqrt{x^2+8x+5} \cdot \frac{\sqrt{x^2+8x+5}}{\sqrt{x^2+8x+5}} = \frac{x^2+8x+5}{\sqrt{x^2+8x+5}} \,/:x^2 = \frac{1}{\infty}$ = NEMA H.A

$\lim_{x \to -\infty} \sqrt{x^2+8x+5} = \lim_{x \to +\infty} \sqrt{x^2-8x+5} \cdot \frac{\sqrt{x^2-8x+5}}{\sqrt{x^2-8x+5}} = \frac{x^2-8x+5}{\sqrt{x^2-8x+5}} = \frac{1}{0}$ NEMA H.A

K.A: $\lim_{x \to +\infty} \frac{\sqrt{x^2+8x+5}}{x} \,/:x = \frac{1}{1} = 1 \quad k = 1$

$l = \lim_{x \to +\infty} \sqrt{x^2+8x+5} - x = \lim_{x \to +\infty} \sqrt{x^2+8x+5} - x \cdot \frac{\sqrt{x^2+8x+5}+x}{\sqrt{x^2+8x+5}+x} = \frac{-x^2+x^2+8x+5}{\sqrt{x^2+8x+5}+x} = \frac{8x+5}{\sqrt{x^2+8x+5}+x} \,/:x = \frac{8}{2} = 4$

$y = x + 4$ D.K.A ✓

$\lim_{x \to -\infty} \frac{\sqrt{x^2+8x+5}}{+x} = \lim_{x \to +\infty} \frac{\sqrt{x^2-8x+5}}{-x} = -1$

$l = \lim_{x \to -\infty} \sqrt{x^2+8x+5} - x \cdot \lim_{x \to +\infty} \sqrt{x^2-8x+5} = x \cdot \frac{\sqrt{x^2-8x+5}+x}{\sqrt{x^2-8x+5}+x} = \frac{-8x+5}{\sqrt{x^2-8x+5}+x} = \frac{-8}{2} = -4$

$y = -x - 4$ L.K.A

② $\left|\begin{array}{cccc|c} 5 & 0 & 4 & 2 & 3 \\ 1 & -1 & 2 & 1 & 1 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{array}\right|$ $\left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 0 \\ 1 & -1 & 2 & 1 & 1 \\ 4 & 1 & 2 & 0 & 1 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right|$ $\begin{array}{l} R_2 - R_1 \\ R_3 - 4R_1 \\ R_4 - 5R_1 \end{array}$ $\left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 0 \\ 0 & -2 & 1 & 0 & 1 \\ 0 & -3 & -2 & -4 & 1 \\ 0 & -5 & -1 & -3 & 3 \end{array}\right| \cdot(-\frac{1}{2})$ $\left|\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & -\frac{1}{2} & 0 & -\frac{1}{2} \\ 0 & -3 & -2 & -4 & 1 \\ 0 & -5 & -1 & -3 & 3 \end{array}\right|$ $\begin{array}{l} R_1 - R_2 \\ R_3 + 3R_2 \\ R_4 + 5R_2 \end{array}$

$\left|\begin{array}{cccc|c} 1 & 0 & \frac{3}{2} & 1 & \frac{1}{2} \\ 0 & 1 & -\frac{1}{2} & 0 & -\frac{1}{2} \\ 0 & 0 & -\frac{7}{2} & -4 & -\frac{1}{2} \\ 0 & 0 & -\frac{7}{2} & -3 & \frac{1}{2} \end{array}\right| \cdot(-\frac{2}{7})$ $\left|\begin{array}{cccc|c} 1 & 0 & \frac{3}{2} & 1 & \frac{1}{2} \\ 0 & 1 & -\frac{1}{2} & 0 & -\frac{1}{2} \\ 0 & 0 & 1 & \frac{8}{7} & \frac{1}{7} \\ 0 & 0 & -\frac{7}{2} & -3 & \frac{1}{2} \end{array}\right|$ $\begin{array}{l} R_1 - \frac{3}{2}R_3 \\ R_2 + \frac{1}{2}R_3 \\ \\ R_4 + \frac{7}{2}R_3 \end{array}$ $\left|\begin{array}{cccc|c} 1 & 0 & 0 & -\frac{5}{7} & \frac{2}{7} \\ 0 & 1 & 0 & \frac{4}{7} & -\frac{3}{7} \\ 0 & 0 & 1 & \frac{8}{7} & \frac{1}{7} \\ 0 & 0 & 0 & 1 & A_4 \end{array}\right|$ $\begin{array}{l} R_1 + \frac{5}{7}R_4 \\ R_2 - \frac{4}{7}R_4 \\ R_3 - \frac{8}{7}R_4 \end{array}$ $\left|\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & -1 \\ 0 & 0 & 1 & 0 & -1 \\ 0 & 0 & 0 & 1 & 1 \end{array}\right|$

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

PROVJERA

$\left|\begin{array}{cccc} 5 & 0 & 4 & 2 \\ 1 & -1 & 2 & 1 \\ 4 & 1 & 2 & 0 \\ 1 & 1 & 1 & 1 \end{array}\right| \cdot \left|\begin{array}{c} 1 \\ -1 \\ -1 \\ 1 \end{array}\right| = \left|\begin{array}{c} 5-4+2 \\ 1+1-2+1 \\ 4-1-2 \\ 1-1-1+1 \end{array}\right| = \left|\begin{array}{c} 7-4 \\ 3-2 \\ 4-3 \\ 2-2 \end{array}\right| = \left|\begin{array}{c} 3 \\ 1 \\ 1 \\ 0 \end{array}\right|$ ✓ ODGOVARA

LUKA KNEŽEVIĆ

6. $\lim_{x\to -1}\left(\frac{\sqrt{x^2-8x+7}-3+x}{x^2+4x+3}\right) = \frac{\sqrt{16}-3-1}{1-4+3} = \frac{4-4}{4-4} = \frac{0}{0}$ NEODREĐENI OBLIK.

IME I PREZIME: **BROJ INDEKSA:**

L'HOSPITAL

$\frac{\frac{1}{2}(x^2-8x+7)^{-\frac{1}{2}}\cdot 2x-8+1}{2x+4} = \frac{x-3}{\sqrt{x^2-8x+7}+2x+4} = \frac{-4}{4-2+4} = \frac{-4}{6} = -\frac{2}{3}$

PROVJERA $\lim_{x\to -1^+}\frac{\sqrt{x^2-8x+7}-3+x}{x^2+4x+3} = \frac{4^+-3-1^+}{0^+} = 0^-$

5. GRAF FUNKCIJE $f(x) = \frac{x^2+8}{x-8}$

1. $D_f = \langle -\infty, 8\rangle \cup \langle 8, +\infty\rangle$

2. $\lim_{x\to 8^+}\frac{x^2+8}{x-8} = \frac{72}{0^+} = +\infty$

$\lim_{x\to 8^-}\frac{x^2+8}{x-8} = \frac{72}{0^-} = -\infty$ $\boxed{8 = V.A}$

$\lim_{x\to\pm\infty}\frac{x^2+8}{x-8} = \frac{+\infty}{+\infty}$ NEMA H.A.

K.A

$\lim_{x\to+\infty}\frac{x^2+8}{x(x-8)} = \frac{x^2+8\,/:x}{x^2-8x\,/:x} = 1$

$\lim_{x\to\pm\infty}\frac{x^2+8}{x-8} - x = \frac{x^2+8-x(x-8)}{x-8} = \frac{x^2-x^2+8x+8}{x-8} = \frac{8x+8}{x-8} = 8$ D.K.A $y = x+8$

$\lim_{x\to-\infty}\frac{x^2+8}{x-8} = \lim_{x\to+\infty}\frac{x^2+8}{-x-8} = \frac{x^2+8}{x(-x-8)} = \frac{x^2+8}{-x^2-8x} = -1$

$\lim_{x\to-\infty}\frac{x^2+8}{x-8} - \lim_{x\to\infty}\frac{x^2+8}{-x-8} + x = \frac{x^2+8-x^2-8x}{-x-8} = \frac{-8x+8\,/:x}{-x-8\,/:x} = 8$

L.K.A $y = -x+8$

3. $f(-x) = f(x)$ $f(-x) = -f(x)$

$\frac{x^2+8}{-x-8}$ NITI PARNA $\frac{x^2+8}{-x-8} = -\left(\frac{x^2+8}{x-8}\right)$ NITI NEPARNA

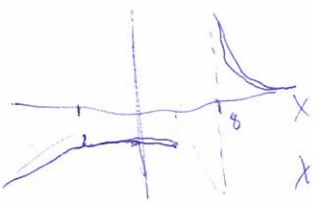
NIJE PERIODIČNA JER NE SADRŽI TRIGONOMETRIJSKE FUNKCIJE.

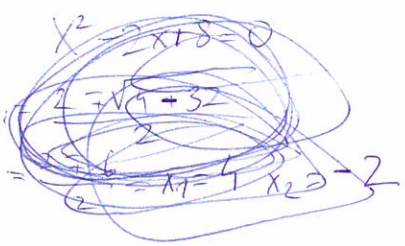
4. $f(x) = 0$

$\frac{x^2+8}{x-8} = 0$ $x^2+8 = 0$

$x_{1,2} = \frac{0 \pm \sqrt{0-32}}{2}$

NEMA RJEŠENJA JER $x^2+8 \neq 0$ NE MOŽE BITI 0.



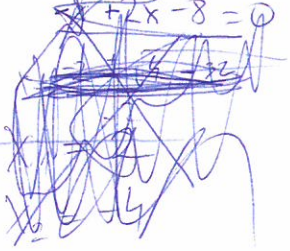


$f(0) = \frac{8}{-8} = -1$ $T(0,-1)$

5. $f'(x) = \frac{(x^2+8)'\cdot(x-8) - (x^2+8)\cdot(x-8)'}{(x-8)^2} = \frac{2x\cdot(x-8)-(x^2+8)}{(x-8)^2} = \frac{2x-x^2-8}{x-8}$

$f(-4) = \frac{24}{-12} = -2$ $f(2) = \frac{-6}{-6} = 1$

$\frac{2x^2-16x-x^2-8}{-2} = \frac{x^2-16x-8}{-2}$



5. $f'(x) = \frac{x^2-16x-8}{(x-8)^2} =$

$x^2 - 16 - 8 = 0$

$x = \frac{16 \pm \sqrt{256+32}}{2} = \frac{16 \pm \sqrt{288}}{2}$

$= \frac{16 \pm 16.97}{2}$

$x_1 = 0.48$

$x_2 = 16.485$

	$-\infty$	0.5	0.48	8	16.45	100	$+\infty$
$f'(x)$		−	0	−	0	+	
$f(x)$		↘		↘		↗	

LOKALNI MINIMUM

$f(16.45) = \frac{278.60}{16.45-8} = \frac{278.6}{8.45} = 32.98$

$f''(x) = \frac{(x^2-16x-8)' \cdot (x-8)^2 - (x^2-16x-8) \cdot (x-8)^2}{(x-8)^4} = \frac{2x-16 \cdot (x-8)^2 - (x^2-16x-8) \cdot 2(x-8)}{(x-8)^4}$

$= \frac{2x-16 \cdot (x^2-16x+64) - (x^2-16x-8)(2x-16)}{(x-8)^4} = \frac{(2x^3-16x^2-32x^2+256x-16x+128) - 2x^3+16x^2+32x^2-256x+16x-128}{(x-8)^4}$

$= \frac{144x-1152}{(x-8)^4}$

$144x - 1152 = 0$

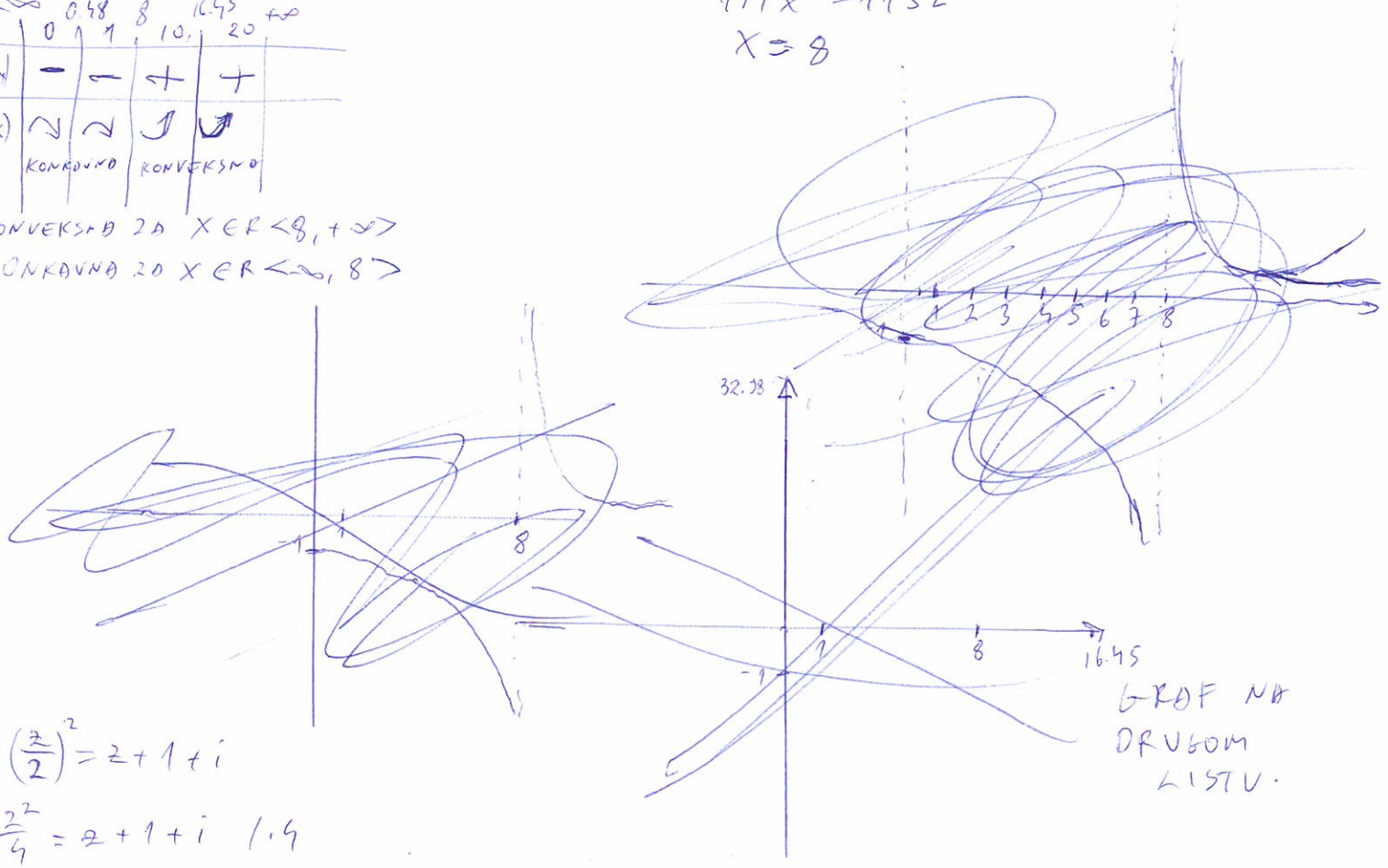
$144x = 1152$

$x = 8$

	$-\infty$	0	0.48	1	8	10	16.45	20	$+\infty$
$f''(x)$		−	0	−	0	+	0	+	
$f(x)$		∩ KONKAVNO		∩ KONKAVNO		∪ KONVEKSNO		∪ KONVEKSNO	

KONVEKSNO ZA $x \in \langle 8, +\infty \rangle$

KONKAVNO ZA $x \in \langle -\infty, 8 \rangle$



GRAF NA DRUGOM LISTU.

1) $\left(\frac{z}{2}\right)^2 = z + 1 + i$

$\frac{z^2}{4} = z + 1 + i \quad / \cdot 4$

$z^2 = 4z + 4 + 4i$

$z^2 - 4z = 4 + 4i$

$z + \bar{z} - 4z = 4 + 4i$

$x + iy \cdot \sqrt{x^2+y^2} - 4z = 4 + 4i$

$\sqrt{x^2+y^2}\,x + \sqrt{x^2+y^2}\,iy - 4x + 4iy = 4 + 4i$

$\sqrt{x^2+y^2}\,x - 4x - 4 = 4i - 4iy \quad y = 4$

$\sqrt{x^2+4^2} - 3x - 4$

$x + 16 - 3x - 4 = 0$

$-2x = -12$

$x = 6$

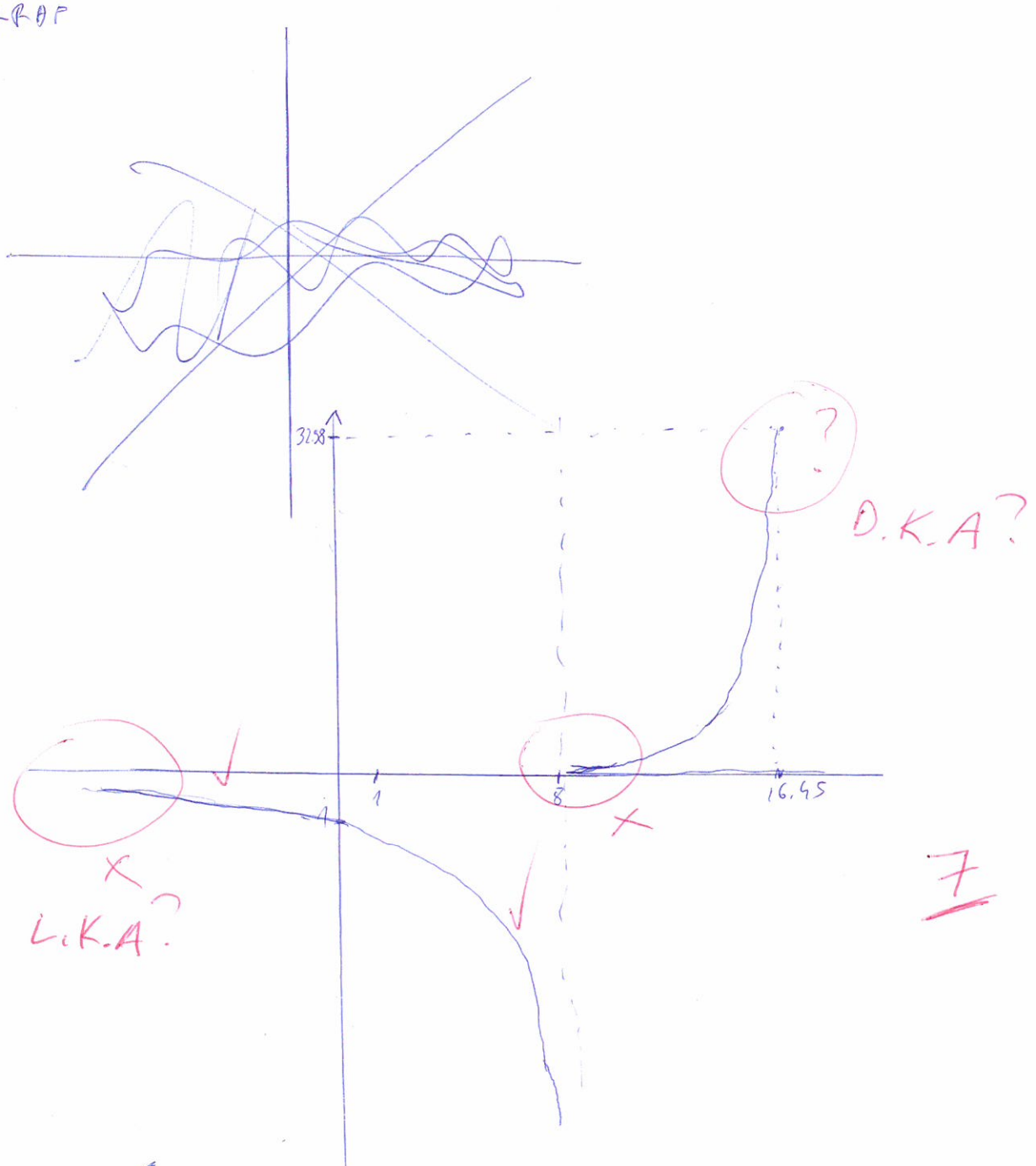
$\boxed{z = 6 + 4i}$ X

UVRSTI I PROVJERI!

LUKA KNEŽEVIĆ

Ime i prezime: **Broj indeksa:**

GRAF



7

4. b)

	$-\infty$	-7.316	-4	-0.68	$+\infty$
	-10	-5	-1	0	
$f'(x)$	$-$	NIJE DEF.		$+$	
$f(x)$	↘	↘	↗	↗	
			LOKALNI MINIMUM		

$f(-4) = \sqrt{16 - 32 + 5} = \sqrt{-11}$ NIJE MINIMUM

NEMA LOKALNOG MAKSIMUMA

~~FUNKCIJA U TOČKI -4 IMA LOKALNI MINIMUM~~

NEMA LOKALNOG MINIMUMA JER TOČKA -4 NIJE U DOMENI FUNKCIJE

X

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: Marko Bilić **BROJ INDEKSA:** 17-1-0061-2011

ZAOKRUŽITI AKO ŽELITE: ustmeni kod prof. Uglešića

POPUNJAVA NASTAVNIK: Broj ↓ bodova — B8

1. Izračunaj sve kompleksne brojeve z takve da $\left|\frac{z}{2}\right|^2 = z + 1 + i$. *Prikaži ih u kompleksnoj ravnini!* — 10+5

2. Riješiti sustav 4 jednadžbe s 4 nepoznanice $\begin{array}{l} 5x + 4z + 2t = 3 \\ x - y + 2z + t = 1 \\ 4x + y + 2z = 1 \\ x + y + z + t = 0 \end{array}$ i obavezno provjeri rješenje: — 10+5

3. Za funkciju $f(x) = \frac{\sin(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. — 8+2

4. Za funkciju: $g(x) = \sqrt{x^2 + 8x + 5}$ treba:
   (a) ispitati domenu — 5
   (b) pronaći lokalne ekstreme — 11
   (c) ispitati asimptote — 14

5. Na temelju ispitivanja toka skicirati graf funkcije e $h(x) = \frac{x^2 + 8}{x - 8}$ — 20 (graf)

6. Izračunati i obavezno na neki način provjeriti koliko iznosi $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right)$. — 8+2

Ukupno: 0

(3.) $f(x) = \frac{\sin(2x)}{\pi}$

$f(x)' = \frac{(\sin 2x)' \cdot x - x' \cdot (\sin 2x)}{x^2}$ $\quad f(\pi) = \frac{0 \cdot x - 0 \cdot (\sin 2x)}{0}$

$f(x)' = \frac{\cos 2x \cdot 2 \cdot x - 1 \cdot \sin 2x}{x^2}$ $\quad f'(\pi) = 0$ ✗

$f(x) = \frac{\cos 4x^2 - \sin 2x}{x^2}$ ✗

(4.) a) $Df =$ Svi realni brojevi od 0 do $+\infty$ ✓ ✗

$\frac{-8 \pm \sqrt{64 - 4 \cdot 5}}{2} = \frac{-8 \pm \sqrt{44}}{2}$

b) ① $\sqrt{x^2+8x+5} = 0 \quad | ^2$

$\frac{-8 \pm \sqrt{64}}{2} =$ $\quad f_x = 0$

$x_1 = 14{,}6$

$x_2 = 1{,}36$ ✗

② $f(0) = \sqrt{0^2 + 8 \cdot 0 + 5} =$

$f(0) = \sqrt{5}$ ✗

c) $f(x) \sqrt{x^2+8x+5}$

$f'(x) = \frac{1}{2\sqrt{x^2+8x+5}} = \frac{1}{2\sqrt{0+0+5}} = \frac{1}{2\sqrt{5}}$

d) $= f''(x) = \frac{(1)' \cdot (2\sqrt{x^2+8x+5}) - 1 \cdot (2\sqrt{x^2+8x+5})'}{(2\sqrt{x^2+8x+5})^2}$

$= \frac{\frac{1}{-2\sqrt{x^2+8x+5}}}{(2\sqrt{x^2+8x+5})^2} = \frac{\frac{1}{-2\sqrt{x^2+8x+5}}}{2\sqrt{x^8+8x^8+5^8}}$

$\frac{1}{1}$

2.

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

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

$$\left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 1 \\ 0 & 1 & -4 & -3 & 0 \\ 0 & 0 & 0 & -1 & -1 \\ 0 & 0 & 7 & 6 & 1 \end{array}\right] \sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 1 \\ 0 & 1 & -4 & -3 & 0 \\ 0 & 0 & 7 & 6 & 1 \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] :7 \sim \left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 1 \\ 0 & 1 & -4 & -3 & 0 \\ 0 & 0 & 1 & \frac{6}{7} & \frac{1}{7} \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] \begin{array}{l} \\ \\ + \frac{6}{7} \\ \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & -1 & 2 & 0 & -1 \\ 0 & 1 & -4 & 0 & 3 \\ 0 & 0 & 1 & 0 & \frac{1}{7} \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] \begin{array}{l} \\ \\ -4 \\ \end{array} \begin{array}{l} \\ \\ -2 \\ \end{array} \sim \left[\begin{array}{cccc|c} 1 & -1 & 0 & 0 & -\frac{9}{7} \\ 0 & 1 & 0 & 0 & \frac{17}{7} \\ 0 & 0 & 1 & 0 & \frac{1}{7} \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] + 1$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & \frac{8}{7} \\ 0 & 1 & 0 & 0 & \frac{17}{7} \\ 0 & 0 & 1 & 0 & \frac{1}{7} \\ 0 & 0 & 0 & 1 & -1 \end{array}\right] \times$$

PROVJERA?

IME I PREZIME: Mario Bilić BROJ INDEKSA: 17-1-0061-2011

(6.) $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right)$

$\lim_{x \to -1} \frac{\sqrt{-1^2 + 8 + 7} - 3 - 1}{-1^2 - 4 + 3} =$

nedefinirani

$\lim_{x \to -1} \frac{\sqrt{1 + 8 + 7} - 3 - 1}{1 - 4 + 3} \Rightarrow \frac{0}{0}$

$\lim_{x \to -1} \frac{\left(\sqrt{x^2 - 8x + 7} - 3 + x\right)'}{(x^2 + 4x + 3)'}$

$\cdot (2x - 8)$

$\lim_{x \to -1} \frac{\frac{1}{2\sqrt{x^2 - 8x + 7}} + 1}{2x + 4}$ ✗

$\lim_{x \to -1} \frac{\frac{1 + 2\sqrt{x^2 - 8x + 7}}{2\sqrt{x^2 - 8x + 7}}}{2x + 4}$

$\lim_{x \to -1} \frac{\frac{1}{1}}{\frac{2x + 4}{1}}$

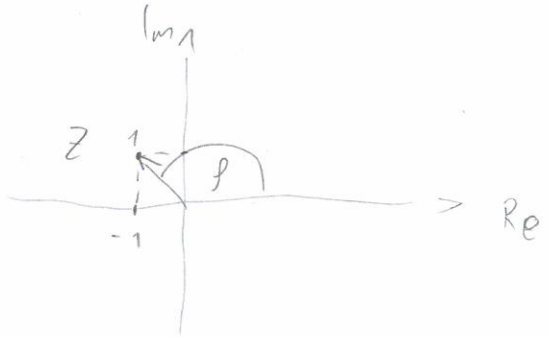
$\lim_{x \to -1} \frac{1}{2x + 4} = \frac{1}{2}$ ✓

Ime i prezime: Marko Bilus **Broj indeksa:** 17-1-0061-2011

1. $\left|\frac{z}{2}\right|^2 = z + 1 + i$

$Re\, z$ $Im\, z$

$z = -1 - i$



$r = \left|\frac{z}{2}\right|^2 = \sqrt{(-1)^2 + 1^2}$ ×

$r = \left|\frac{z}{2}\right|^2 = \sqrt{2}$

$\varphi = \pi + \frac{\pi}{4} = \frac{5\pi}{4}$

$k = 0, 1, 2, 3.$

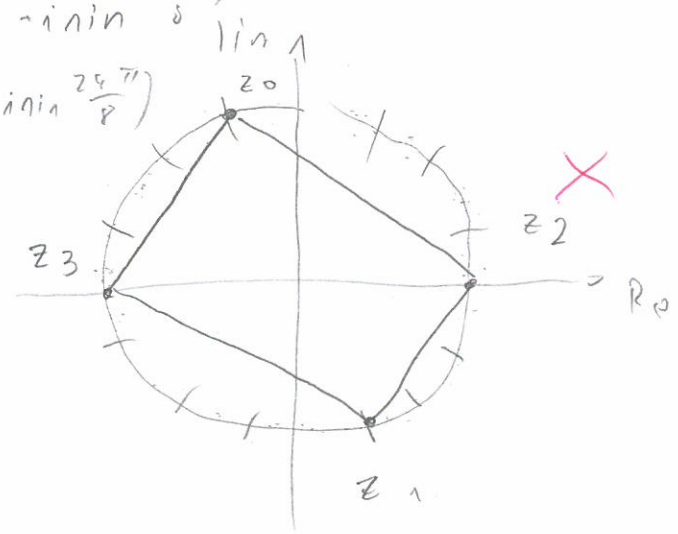
$z_0 = \sqrt[4]{2}\left(\cos\frac{\frac{5\pi}{4} + 2\cdot 0\pi}{2} + i\sin\frac{\frac{5\pi}{4} + 2\cdot 0\pi}{2}\right)$

$z_0 = \sqrt[4]{2}\cdot\left(\cos\frac{5\pi}{8} + i\sin\frac{5\pi}{8}\right)$

$z_1 = \sqrt[4]{2}\cdot\left(\cos\frac{\frac{13\pi}{4}}{2} + i\sin\frac{\frac{13\pi}{4}}{2}\right) = \sqrt[4]{2}\cdot\left(\cos\frac{13\pi}{8} + i\sin\frac{13\pi}{8}\right)$

$z_2 = \sqrt[4]{2}\cdot\left(\cos\frac{15\pi}{8} + i\sin\frac{15\pi}{8}\right)$

$z_3 = \sqrt[4]{2}\cdot\left(\cos\frac{21\pi}{8} + i\sin\frac{21\pi}{8}\right)$

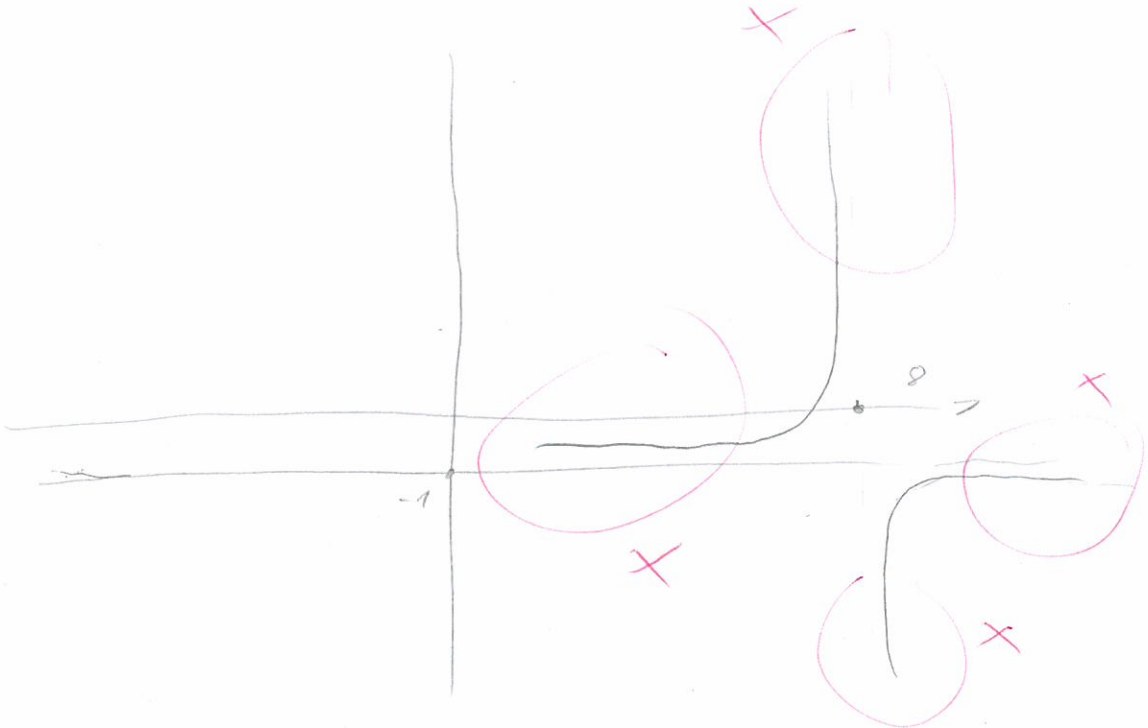


(5) $Df =$ svi realni osim $+8$

$-\infty$  $+\infty$

$$\frac{0^2+8}{0-8} = \frac{8}{-8} = -1$$

$$\frac{2x\cdot(x-8)-(x^2+8)\cdot 1}{(x-8)^2} = \frac{2x^2-16x-x^2-8}{(x-8)^2} = \frac{x^2-16x-8}{(x-8)^2}$$



MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod ⇓⇓ B8

IME I PREZIME: MATE ĆOSIĆ **BROJ INDEKSA:** 55924

ZAOKRUŽITI AKO ŽELITE: ustmeni kod prof. Uglešića

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Izračunaj sve kompleksne brojeve z takve da $\left|\frac{z}{2}\right|^2 = z + 1 + i$. *Prikaži ih u kompleksnoj ravnini!* 10+5

2. Riješiti sustav 4 jednadžbe s 4 nepoznanice $\begin{matrix} 5x + 4z + 2t = 3 \\ x - y + 2z + t = 1 \\ 4x + y + 2z = 1 \\ x + y + z + t = 0 \end{matrix}$ i obavezno provjeri rješenje: 10+5

3. Za funkciju $f(x) = \frac{\sin(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 8+2

4. Za funkciju: $g(x) = \sqrt{x^2 + 8x + 5}$ treba:
   (a) ispitati domenu 5
   (b) pronaći lokalne ekstreme 11
   (c) ispitati asimptote 14

5. Na temelju ispitivanja toka skicirati graf funkcije e $h(x) = \frac{x^2 + 8}{x - 8}$ 20 (graf)

6. Izračunati i obavezno na neki način provjeriti koliko iznosi $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right)$. 8+2

Ukupno: 30

1. $\left|\frac{z}{2}\right|^2 = z + 1 + i$

$\frac{\sqrt{x^2+y^2}^2}{4} = x + yi + 1 + i$

$\frac{x^2}{4} + \frac{y^2}{4} = x + yi + 1 + i \;/\cdot 4$

$x^2 + y^2 = 4(x + yi + 1 + i)$

$x^2 + y^2 = 4x + 4yi + 4 + 4i$

$4y = 4 \;/\cdot \frac{1}{4}$

$y = 1$ $\quad y = -1$ ×

$x^2 + y^2 = 4x + 4$

$x^2 + 1 = 4x + 4$

$x^2 - 4x - 4 = 0$ ×

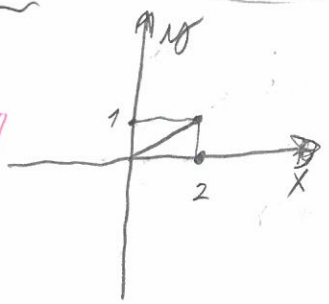
$x_{1,2} = \frac{4 \pm \sqrt{4^2 - 4 \cdot 1 \cdot (-4)}}{2}$

$x_{1,2} = \frac{4 \pm \sqrt{16 - 16}}{2}$

$x_{1,2} = 2$

$y = 1$

$x = 2$



$x^2 - 4x - 3 = 0$

2.

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

$$\left[\begin{array}{cccc|c} 1 & -1 & 2 & 1 & 1 \\ 0 & 1 & -\frac{6}{5} & -\frac{3}{5} & -\frac{2}{5} \\ 0 & 5 & -6 & -4 & -3 \\ 0 & 2 & -1 & 0 & -1 \end{array}\right] \begin{array}{l} \cdot 1 \\ \cdot(-5) \\ \cdot(-2) \end{array} \sim \left[\begin{array}{cccc|c} 1 & 0 & \frac{5}{5} & \frac{2}{5} & \frac{3}{5} \\ 0 & 1 & -\frac{6}{5} & -\frac{3}{5} & -\frac{2}{5} \\ 0 & 0 & 0 & -1 & -1 \\ 0 & 0 & \frac{7}{5} & \frac{6}{5} & -\frac{1}{5} \end{array}\right]$$

$$\left[\begin{array}{cccc|c} 1 & 0 & \frac{4}{5} & \frac{2}{5} & \frac{3}{5} \\ 0 & 1 & -\frac{6}{5} & -\frac{3}{5} & -\frac{2}{5} \\ 0 & 0 & \frac{7}{5} & \frac{6}{5} & -\frac{1}{5} \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] \cdot\frac{5}{7} \sim \left[\begin{array}{cccc|c} 1 & 0 & \frac{5}{5} & \frac{2}{5} & \frac{3}{5} \\ 0 & 1 & -\frac{6}{5} & -\frac{3}{5} & -\frac{2}{5} \\ 0 & 0 & 1 & \frac{6}{7} & -\frac{1}{7} \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] \begin{array}{l} \frac{6}{5} \\ -\frac{4}{5} \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & -\frac{2}{7} & \frac{5}{7} \\ 0 & 1 & 0 & \frac{3}{7} & -\frac{4}{7} \\ 0 & 0 & 1 & \frac{6}{7} & -\frac{1}{7} \\ 0 & 0 & 0 & -1 & -1 \end{array}\right] (\cdot -1) \sim \left[\begin{array}{cccc|c} 1 & 0 & 0 & -\frac{2}{7} & \frac{5}{7} \\ 0 & 1 & 0 & \frac{3}{7} & -\frac{4}{7} \\ 0 & 0 & 1 & \frac{6}{7} & -\frac{1}{7} \\ 0 & 0 & 0 & 1 & 1 \end{array}\right] \begin{array}{l} \frac{2}{7} \\ -\frac{3}{7} \\ -\frac{6}{7} \end{array}$$

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

$$\begin{array}{l} x = 1 \\ y = -1 \\ z = -1 \\ t = 1 \end{array}$$

$5 \cdot 1 + 0 \cdot (-1) + 4 \cdot (-1) + 2 \cdot 1 = 3$

$3 = 3$

$1 \cdot 1 + (-1) \cdot (-1) + 2 \cdot (-1) + 1 \cdot 1 = 1$

$1 = 1$

$4 \cdot 1 + 1 \cdot (-1) + 2 \cdot (-1) + 0 \cdot 1 = 1$

$1 = 1$

$1 \cdot 1 + 1 \cdot (-1) + 1 \cdot (-1) + 1 \cdot 1 = 0$

$0 = 0$

✓

IME I PREZIME: MATE ĆOSIĆ BROJ INDEKSA: 55924

3.

$$f(x) = \frac{\sin(2x)}{x}$$

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

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

$$f'(\pi) = 0{,}637$$ ✓

4. DOMÉNA

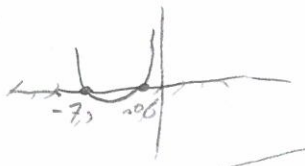
$$g(x) = \sqrt{x^2+8x+5}$$

$$x^2+8x+5 \geq 0$$

$$x_{1,2} = \frac{-8 \pm \sqrt{8^2-4\cdot 5}}{2} =$$

$$x_1 = -0{,}68$$

$$x_2 = -7{,}32$$



$D(x) = x \in \langle -\infty, -7{,}32] \cup [0{,}68, +\infty \rangle$ ✓

LOK. EKSTR.

$$g(x) = \sqrt{x^2+8x+5}$$

$$g'(x) = \frac{1}{2\sqrt{x^2+8x+5}} \cdot 2x+8$$

$$g'(x) = \frac{2x+8}{2\sqrt{x^2+8x+5}} = \frac{2(x+4)}{2\sqrt{x^2+8x+5}}$$

NEMA ✗

$$g''(x) = \frac{1 \cdot \sqrt{x^2+8x+5} - (x+4) \cdot \frac{1}{2\sqrt{x^2+8x+5}} \cdot 2x+8}{(\sqrt{x^2+8x+5})^2}$$

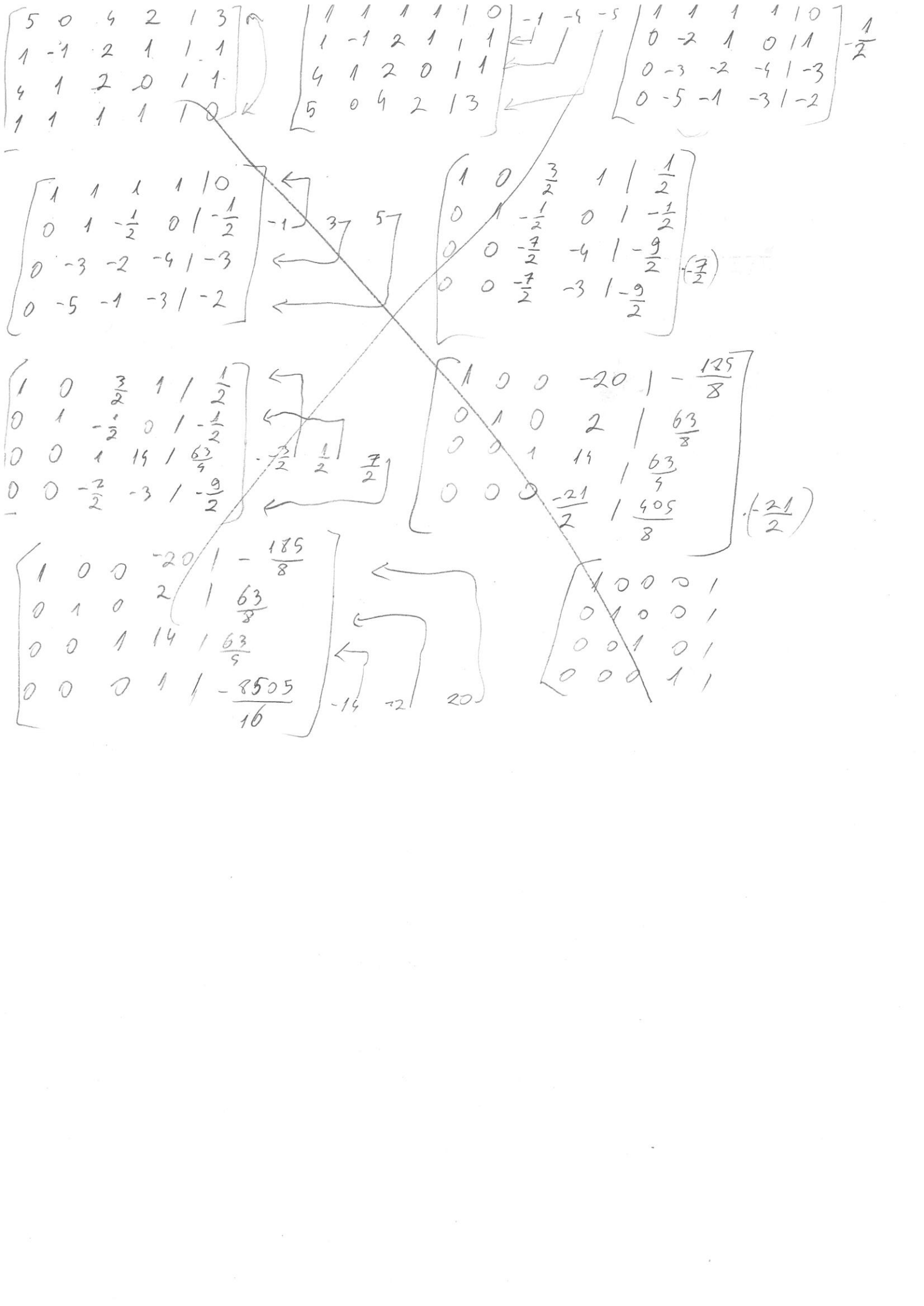
$$g''(x) = \frac{\sqrt{x^2+8x+5} - \frac{(x+4)(x+4)}{2\sqrt{x^2+8x+5}}}{\sqrt{x^2+8x+5}}$$

$$g'(x) \frac{x+4}{\sqrt{x^2+8x+5}}$$

N. T.

$$x = -4$$

ASIMPTOTE ?



MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod⇓⇓ B8

IME I PREZIME: JOSIP MARIĆ **BROJ INDEKSA:** 17-2-0227-2012

ZAOKRUŽITI AKO ŽELITE: ustmeni kod prof. Uglešića

POPUNJAVA NASTAVNIK Broj ↓ bodova

1. Izračunaj sve kompleksne brojeve z takve da $\left|\frac{z}{2}\right|^2 = z + 1 + i$. *Prikaži ih u kompleksnoj ravnini!* 10+5

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3. Za funkciju $f(x) = \frac{\sin(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 8+2

4. Za funkciju: $g(x) = \sqrt{x^2 + 8x + 5}$ treba:
   (a) ispitati domenu 5
   (b) pronaći lokalne ekstreme 11
   (c) ispitati asimptote 14

5. Na temelju ispitivanja toka skicirati graf funkcije e $h(x) = \frac{x^2 + 8}{x - 8}$ 20 (graf)

6. Izračunati i obavezno na neki način provjeriti koliko iznosi $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right)$. 8+2

Ukupno: 15

2.

$$\left[\begin{array}{cccc|c} 5 & 0 & 4 & 2 & 3 \\ 1 & -1 & 2 & 1 & 1 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{array}\right] \sim \left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 0 \\ 1 & -1 & 2 & 1 & 1 \\ 4 & 1 & 2 & 0 & 1 \\ 5 & 0 & 4 & 2 & 3 \end{array}\right] \begin{matrix} \\ \text{II}-\text{I} \\ \text{III}-4\text{I} \\ \text{IV}-5\text{I} \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 0 \\ 0 & -2 & 1 & 0 & 1 \\ 0 & -3 & -2 & -4 & 1 \\ 0 & -5 & -1 & -3 & 3 \end{array}\right] \begin{matrix} \\ \\ \text{III}-\text{II} \\ \\ \end{matrix} \sim$$

$$\sim \left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & 3 & 4 & 0 \\ 0 & -3 & -2 & -4 & 1 \\ 0 & -5 & -1 & -3 & 3 \end{array}\right] \begin{matrix} \text{I}-\text{II} \\ \\ \text{III}+3\text{II} \\ \text{IV}+5\text{II} \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 0 & -2 & -3 & 0 \\ 0 & 1 & 3 & 4 & 0 \\ 0 & 0 & 7 & 8 & 1 \\ 0 & 0 & 14 & 17 & 3 \end{array}\right] \begin{matrix} \\ \\ \text{III}:7 \\ \\ \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 0 & -2 & -3 & 0 \\ 0 & 1 & 3 & 4 & 0 \\ 0 & 0 & 1 & \frac{8}{7} & \frac{1}{7} \\ 0 & 0 & 14 & 17 & 3 \end{array}\right] \begin{matrix} \\ \\ \\ \text{IV}-14\text{III} \end{matrix} \sim$$

$$\sim \left[\begin{array}{cccc|c} 1 & 0 & -2 & -3 & 0 \\ 0 & 1 & 3 & 4 & 0 \\ 0 & 0 & 1 & \frac{8}{7} & \frac{1}{7} \\ 0 & 0 & 0 & 1 & 1 \end{array}\right] \begin{matrix} \text{I}+3\text{IV} \\ \text{II}-4\text{IV} \\ \text{III}-\frac{8}{7}\text{IV} \\ \\ \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 0 & -2 & 0 & 3 \\ 0 & 1 & 3 & 0 & -4 \\ 0 & 0 & 1 & 0 & -1 \\ 0 & 0 & 0 & 1 & 1 \end{array}\right] \begin{matrix} \text{I}+2\text{III} \\ \text{II}-3\text{III} \\ \\ \\ \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & -1 \\ 0 & 0 & 1 & 0 & -1 \\ 0 & 0 & 0 & 1 & 1 \end{array}\right]$$

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

PROVJERA:

$5 \cdot 1 + 4 \cdot (-1) + 2 \cdot 1 = 3$ ✓

$1 - 1 + (-1) + 1 = 0$ ✓

(5.) $h(x) = \frac{x^2+8}{x-8}$

1. Domena

$x - 8 \neq 0$

$x \neq 8$

$D_f: \mathbb{R} \setminus \{8\}$

2. parnost, neparnost

$h(-x) = \frac{-x^2+8}{-x-8}$

$h(-x) = \frac{x^2+8}{-x-8}$

funkcija nije ni parna ni neparna

3. nultočke

$x^2 + 8 = 0$

$x(x+8) = 0$

$x_1 = 0, \quad x_2 = -8$

4. asimptote

H. D

$\lim_{x \to +\infty} h(x) = \frac{x^2+8 \,/: x^2}{x-8 \,/: x}$

$\lim_{x \to +\infty} h(x) = \frac{x + \frac{8}{x}}{1 - \frac{8}{x}} \to \frac{\infty}{1} = +\infty$

GRAF?

(4.) $g(x) = \sqrt{x^2+8x+5}$

1. Domena

$x^2 + 8 + 5 \neq 0$

$x_{1,2} = \frac{b^2 \pm \sqrt{4ac}}{2a}$

$x_{1,2} = \frac{64 \pm \sqrt{20}}{2}$

?

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod⇓⇓ B8

IME I PREZIME: TOMISLAV PERKOVIĆ **BROJ INDEKSA:** ~~5 [illegible]~~ 17-2-0229-2012

ZAOKRUŽITI AKO ŽELITE: ustmeni kod prof. Uglešića

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Izračunaj sve kompleksne brojeve z takve da $\left|\frac{z}{2}\right|^2 = z + 1 + i$. *Prikaži ih u kompleksnoj ravnini!* 10+5

2. Riješiti sustav 4 jednadžbe s 4 nepoznanice $\begin{matrix} 5x + 4z + 2t = 3 \\ x - y + 2z + t = 1 \\ 4x + y + 2z = 1 \\ x + y + z + t = 0 \end{matrix}$ i obavezno <u>provjeri</u> rješenje: ~~10+5~~

3. Za funkciju $f(x) = \frac{\sin(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 8+2

4. Za funkciju: $g(x) = \sqrt{x^2 + 8x + 5}$ treba:
   (a) ispitati domenu (5)
   (b) pronaći lokalne ekstreme 11
   (c) ispitati asimptote 14

5. Na temelju ispitivanja toka skicirati graf funkcije e $h(x) = \frac{x^2 + 8}{x - 8}$ 20 (graf)

6. Izračunati i obavezno na neki način provjeriti koliko iznosi $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right)$. ~~8+2~~

Ukupno: (5)

(2)

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

$$\left[\begin{array}{cccc|c} 1 & 0 & -4 & -2 & 3 \\ 0 & 0 & 11 & 5 & -8 \\ 0 & 0 & 13 & 5 & 9 \\ 0 & -1 & -5 & -3 & 3 \end{array}\right] \sim \left[\begin{array}{cccc|c} 1 & 0 & -4 & -2 & 3 \\ 0 & -1 & -5 & -3 & 3 \\ 0 & 0 & 13 & 5 & 9 \\ 0 & 0 & 11 & 5 & -8 \end{array}\right] \sim \left[\begin{array}{cccc|c} 1 & 0 & -4 & -2 & 3 \\ 0 & -1 & -5 & -3 & 3 \\ 0 & 0 & 1 & \frac{5}{13} & \frac{9}{13} \\ 0 & 0 & 11 & 5 & -8 \end{array}\right] \begin{matrix} \\ \cdot(-5) \\ \\ +(-11) \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 0 & 0 & -\frac{6}{13} & \frac{35}{13} \\ 0 & -1 & 0 & -\frac{14}{13} & \frac{45}{13} \\ 0 & 0 & 1 & \frac{5}{13} & \frac{9}{13} \\ 0 & 0 & 0 & \frac{10}{13} & -\frac{5}{13} \end{array}\right] \cdot \frac{13}{10}$$

$$\sim \left[\begin{array}{cccc|c} 1 & 0 & 0 & -\frac{6}{13} & \frac{35}{13} \\ 0 & 1 & 0 & \frac{14}{13} & -\frac{45}{13} \\ 0 & 0 & 1 & \frac{5}{13} & \frac{9}{13} \\ 0 & 0 & 0 & 1 & -\frac{5}{13} \end{array}\right] \begin{matrix} +\frac{6}{13} \\ +(-\frac{14}{13}) \\ +(-\frac{5}{13}) \\ \\ \end{matrix} \sim \left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & \frac{45}{13} \\ 0 & 1 & 0 & 0 & -\frac{5}{13} \\ 0 & 0 & 1 & 0 & \frac{34}{13} \\ 0 & 0 & 0 & 1 & -\frac{5}{13} \end{array}\right]$$

PROVJERA? X

(4) $g(x) = \sqrt{x^2 + 8x + 5}$ c)

a) $x^2 + 8x + 5$

$a = 1 \quad b = 8 \quad c = 5$

$x_{1,2} = \frac{-8 \pm \sqrt{8^2 - 4 \cdot 5 \cdot 1}}{2} = \frac{-8 \pm \sqrt{64 - 20}}{2}$

$x_{1,2} = \frac{-8 \pm \sqrt{44}}{2}$

$x_1 = \frac{-8 + 6{,}63}{2} = -0{,}68 \qquad x_2 = \frac{-8 - 6{,}63}{2} = -7{,}3$

$D_f \langle -\infty, -7{,}3 \rangle \cup \langle -0{,}68, +\infty \rangle$

UKLJUČUJE GRANICE

(6) $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right) = \frac{\sqrt{(-1)^2 - 8 \cdot (-1) + 7} - 3 - 1}{(-1)^2 + 4 \cdot (-1) + 3} = \frac{\sqrt{1 + 8 + 7} - 3 - 1}{1 - 4 + 3} = \frac{4 - 3 - 1}{1 - 4 + 3} = \frac{0}{0}$?

MATEMATIKA 1: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** Obavezno popuniti sva polja ispod⇓⇓ B8

IME I PREZIME: TONI UGLEŠIĆ **BROJ INDEKSA:** 17-1-0065-2011

ZAOKRUŽITI AKO ŽELITE: (usmeni kod prof. Uglešića)

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Izračunaj sve kompleksne brojeve z takve da $\left|\frac{z}{2}\right|^2 = z + 1 + i$. *Prikaži ih u kompleksnoj ravnini!* 10+5

2. Riješiti sustav 4 jednadžbe s 4 nepoznanice $\begin{matrix} 5x + 4z + 2t = 3 \\ x - y + 2z + t = 1 \\ 4x + y + 2z = 1 \\ x + y + z + t = 0 \end{matrix}$ i obavezno provjeri rješenje: 10+5

3. Za funkciju $f(x) = \frac{\sin(2x)}{x}$ odrediti koliko iznosi $f'(\pi)$. 8+2

4. Za funkciju: $g(x) = \sqrt{x^2 + 8x + 5}$ treba:
   (a) ispitati domenu 5
   (b) pronaći lokalne ekstreme 11
   (c) ispitati asimptote 14

5. Na temelju ispitivanja toka skicirati graf funkcije e $h(x) = \frac{x^2 + 8}{x - 8}$ 20 (graf)

6. Izračunati i obavezno na neki način provjeriti koliko iznosi $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + x}{x^2 + 4x + 3} \right)$. 8+2

Ukupno: 0

2. $\left|\begin{matrix} 5 & 0 & 4 & 2 & 3 \\ 1 & -1 & 2 & 1 & 1 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{matrix}\right| \; I - III$ $\left|\begin{matrix} 1 & 1 & 2 & 2 & 3 \\ 1 & -1 & 2 & 1 & 1 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{matrix}\right|$ $\left|\begin{matrix} 1 & 1 & 2 & 2 & 3 \\ 4 & 1 & 2 & 0 & 1 \\ 1 & -1 & 2 & 1 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{matrix}\right| \; III - IV$

$\left|\begin{matrix} 1 & 1 & 2 & 2 & 3 \\ 4 & 1 & 2 & 0 & 1 \\ 0 & -2 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{matrix}\right|$ ✗

6. $\lim_{x \to -1} \left(\frac{\sqrt{x^2 - 8x + 7} - 3 + 1}{x^2 + 4x + 3} \right) = \lim_{x \to -1} \left(\frac{\sqrt{(-1)^2 - 8 \cdot (-1) + 7} - 3 + (-1)}{(-1)^2 + 4 \cdot (-1) + 3} \right) = \lim_{x \to -1} \left(\frac{4 - 3 - 1}{1 - 4 + 3} \right) =$

$= \lim_{x \to -1} \frac{0}{0}$?

1. $\left|\frac{z}{2}\right|^2 = z + 1 + i$ $\left|\frac{1}{2}\right|^2 = 1 + 1 + i$

$z = 1$

$\frac{1}{4} = 2 + i$

$\frac{1}{4} - 2 = i$

$i = -\frac{7}{4}$ ✗