

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

D2

IME I PREZIME:

TONI GRBIC!

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POPUNJAVA
NASTAVNIK
Broj ↓
bodova

1. Riješi jednadžbu među kompleksnim brojevima: $z^3 - 6 - 6i = 0$. *Prikaži rješenja u kompleksnoj ravnini!*

12+3

2. Koji su globalni ekstremi funkcije $g(x) = \sqrt{6 - x^2}$

10

3. Ispitati asimptote funkcije: $h(x) = \sqrt{x^2 - 2x} + x$. Zatim dovršiti ispitivanje toka i skicirati graf.

10(asimptote)
20(graf)

4. Odrediti i uvrštavanjem (kalkulator) provjeriti rezultat

(a) $\lim_{x \rightarrow 0} \left(\frac{\sqrt{6 + x^2} - \sqrt{6}}{x} \right) =$

7+2

(b) $\lim_{x \rightarrow \infty} \left(\frac{e^x + 6}{e^x} \right) =$

4+2

5. Riješi sustav Gaussovom metodom i obavezno provjeri rješenje:

15+5

$$4x - y + z + 2u = -1$$

$$2x + y - 3u = 4$$

$$x - y + 2z + u = 2$$

$$2x + y + z - 4u = 1$$

6. Odrediti prvu derivaciju funkcije: $f(x) = \ln(\sin(2x^2 - 1))$.

10

Ukupno:

25

TONI GRBIC

$$\textcircled{1} z^3 - 6 - 6i = 0$$

$$z^3 = 6 + 6i$$

$$x = 6$$

$$y = 6$$

$$r = \sqrt{6^2 + 6^2}$$

$$r = 6\sqrt{2}$$

$$\text{arg} \rho = \frac{6}{6} = 1$$

$$\rho = 0,785$$

$$\sqrt[n]{z} = \sqrt[n]{r} \left(\cos \frac{\rho + 2k\pi}{n} + i \sin \frac{\rho + 2k\pi}{n} \right)$$

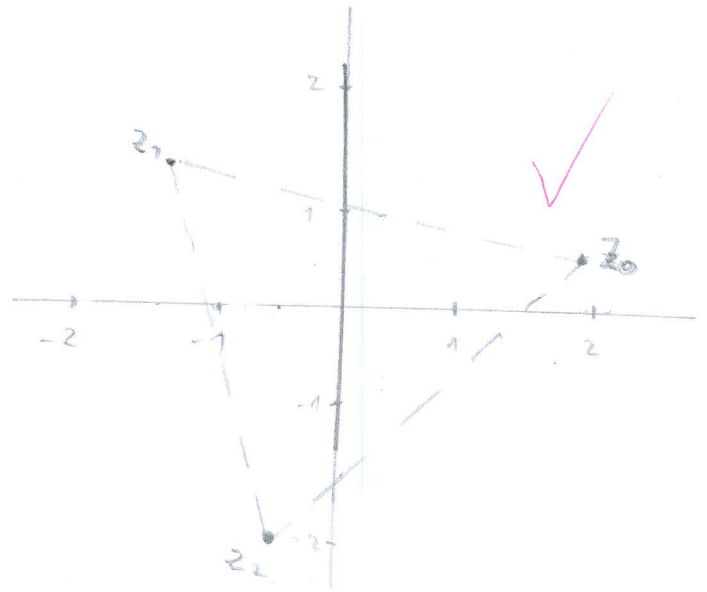
$$\sqrt[3]{z} = \sqrt[3]{6\sqrt{2}} \left(\cos \frac{0,785 + 2 \cdot 0 \cdot \pi}{3} + i \sin 0,262 \right)$$

$$\sqrt[3]{z} = 2,04 (0,966 + i 0,259)$$

$$z_0 = 1,97 + i 0,528$$

$$z_1 = -1,44 + i 1,44$$

$$z_2 = -0,53 - i 1,97$$



$$\textcircled{6} f(x) = \ln(\sin(2x^2 - 1))$$

$$f'(x) = \frac{1}{\sin(2x^2 - 1)} \cdot (-\cos(2x^2 - 1)) \cdot 4x$$

$$5) \begin{bmatrix} 4 & -1 & 1 & 2 & -1 \\ 2 & 1 & 0 & -3 & 4 \\ 1 & -1 & 2 & 1 & 2 \\ 2 & 1 & 1 & -4 & 1 \end{bmatrix} \sim \begin{bmatrix} 1 & -1 & 2 & 1 & 2 \\ 2 & 1 & 0 & -3 & 4 \\ 4 & -1 & 1 & 2 & -1 \\ 2 & 1 & 1 & -4 & 1 \end{bmatrix} \begin{array}{l} \text{II} - 2\text{I} \\ \text{III} - 4\text{I} \\ \text{IV} - 2\text{I} \end{array}$$

$$\sim \begin{bmatrix} 1 & -1 & 2 & 1 & 2 \\ 0 & 3 & -4 & -5 & 0 \\ 4 & -1 & 1 & 2 & -1 \\ 2 & 1 & 1 & -4 & 1 \end{bmatrix} \begin{array}{l} \text{III} - 4\text{I} \\ \text{IV} - 2\text{I} \end{array} \sim \begin{bmatrix} 1 & -1 & 2 & 1 & 2 \\ 0 & 3 & -4 & -5 & 0 \\ 0 & 3 & -7 & -2 & -9 \\ 2 & 1 & 1 & -4 & 1 \end{bmatrix} \begin{array}{l} \text{IV} - 2\text{I} \end{array}$$

$$\sim \begin{bmatrix} 1 & -1 & 2 & 1 & 2 \\ 0 & 3 & -4 & -5 & 0 \\ 0 & 3 & -7 & -2 & -9 \\ 0 & 3 & -3 & -6 & -3 \end{bmatrix} \begin{array}{l} \text{IV} - \text{III} \\ \text{II} - \text{III} \end{array} \sim \begin{bmatrix} 1 & -1 & 2 & 1 & 2 \\ 0 & 3 & -4 & -5 & 0 \\ 0 & 3 & -7 & -2 & -9 \\ 0 & 0 & 4 & -4 & 6 \end{bmatrix}$$

$$\sim \begin{bmatrix} 1 & -1 & 2 & 1 & 2 \\ 0 & 0 & 3 & -3 & 9 \\ 0 & 3 & -7 & -2 & -9 \\ 0 & 0 & 4 & -4 & 6 \end{bmatrix}$$

$$x - 4 + 6 = 2$$

$$x = 2 - 2$$

$$\boxed{x = 0}$$

$$P_0 = \begin{bmatrix} 0 \\ 5 \\ 3 \\ 0 \end{bmatrix}$$

$$3z - 3u = 9$$

$$3z = 9 + 3u \quad /:3$$

$$z = 3 + u$$

$$\boxed{z = 3}$$

$$3y - 7 \cdot 3 = -9$$

$$3y = -9 + 21$$

$$\boxed{y = 4}$$

$$4(3+u) - 4u = 6$$

$$12 + 4u - 4u = 6$$

$$\boxed{u = 0}$$

PROVERA

$$0 - 4 + 6 = 2$$

$$2 = 2 \quad \checkmark$$

