Pismeni ispit iz Matematike I
Ak. god. 2014./2015.

Zadatak 1 *Odredite domenu funkcije f zadane formulom*

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

Zadatak 2 *Odredite parametar α tako da funkcija*

$$f(x) = \begin{cases} (1 + \alpha x)^{\frac{1}{x}} & , x < 0 \\ \sin x + e^2 & , x \geq 0 \end{cases}$$

bude neprekidna.

Zadatak 3 *Odredite koeficijent uz x^{20} u izrazu $(x^3 + x^5)^6$.*

Zadatak 4 *Izračunajte sljedeći limes:*

$$\lim_{x \to \infty} \frac{\ln(3 + 2e^{3x})}{\ln(6 + 3e^{3x})}.$$

Zadatak 5 *Odredite intervale konveksnosti i intervale konkavnosti funkcije zadane fomulom:*

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

	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
	$0°$	$30°$	$45°$	$60°$	$90°$	$180°$	$270°$	$360°$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	0	-1	0
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1	0	1
tg	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	$\pm\infty$	0	$\pm\infty$	0

TABLICA DERIVACIJA		
$(c)' = 0,\ c \in \mathbb{R}$	$(x)' = 1,\ x \in \mathbb{R}$	$(x^\alpha)' = \alpha x^{\alpha-1},\ \alpha \in \mathbb{R},\ x \in \mathbb{R}$
$(\sqrt{x})' = \dfrac{1}{2\sqrt{x}},\ x > 0$	$(\log_a x)' = \dfrac{1}{x}\log_a e,\ x > 0$	$(\ln x)' = \dfrac{1}{x},\ x > 0$
$(a^x)' = a^x \ln a,\ x \in \mathbb{R}$	$(e^x)' = e^x,\ x \in \mathbb{R}$	$(\sin x)' = \cos x,\ x \in \mathbb{R}$
$(\cos x)' = -\sin x,\ x \in \mathbb{R}$	$(\operatorname{tg} x)' = \dfrac{1}{\cos^2 x},\ x \neq (2k-1)\dfrac{\pi}{2},\ k \in \mathbb{Z}$	$(\operatorname{ctg} x)' = \dfrac{-1}{\sin^2 x},\ x \neq k\pi,\ k \in \mathbb{Z}$