Pismeni ispit iz Matematike I
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Zadatak 1 *Odredite koeficijent uz x^4 u izrazu $(\sqrt{x} + x^2)^5$.*

Zadatak 2 *Odredite sve kompleksne brojeve z za koje vrijede sljedeći uvjeti:*

$$\begin{cases} |z| = 1 \\ \overline{z}^2 - \frac{1}{z} = -1. \end{cases}$$

Zadatak 3 *Odredite limes*

$$\lim_{x \to \infty} x \left(2 \ln (x+1) - \ln x^2 \right).$$

Zadatak 4 *Odredite jednadžbu tangente na graf funkcije $f(x) = \sqrt{\frac{e^x - \text{tg}\, x}{\cos x}}$ u točki s apscisom $x_0 = 0$.*

Zadatak 5 *Ispitajte tok funkcije*

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

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