

Pismeni ispit iz Matematike II

Ak. god. 2013./2014.

Zadatak 1 *Riješite neodređeni integral*

$$\int \frac{1}{5} \left(1 - \frac{1}{x} \right) \cdot \cos(5(x - \ln x)) dx.$$

Zadatak 2 *Izračunajte volumen tijela nastalog rotacijom krivulje $x + 5y^2 + 10y = 0$ oko y osi.*

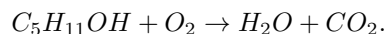
Zadatak 3 *Riješite diferencijalnu jednadžbu*

$$3x^5 e^{5x} - 2x^2 y' + 6xy = 0.$$

Zadatak 4 *Zadane su matrice $A = \begin{bmatrix} -2 & -3 & -1 \\ 4 & -2 & x \\ -4 & 3 & 4 \end{bmatrix}$ i $B = \begin{bmatrix} 1 & 4 & 1 \\ 2 & 3 & 1 \\ -3 & 5 & -4 \end{bmatrix}$. Odredite $x \in \mathbb{Z}$*

takav da je $\det A = 6$. Zatim, za dobiveni x izračunajte inverz matrice A i trag matrice $-2A^T \cdot B^T$

Zadatak 5 *Pomoću sustava linearnih jednadžbi izjednačite kemijsku jednadžbu*



Dobiveni sustav riješite Gaussovom metodom eliminacije ili Gauss-Jordanovom metodom.

TABLICA DERIVACIJA I INTEGRALA

$(c)' = 0, c \in \mathbb{R}$	$\int 1 dx = x + C, C \in \mathbb{R}$
$(x)' = 1, x \in \mathbb{R}$	$\int \alpha dx = \alpha x + C, \alpha, C \in \mathbb{R}$
$(x^\alpha)' = \alpha x^{\alpha-1}, \alpha \in \mathbb{R}, x \in \mathbb{R}$	$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1} + C, \alpha \neq -1, C \in \mathbb{R}$
$(\log_a x)' = \frac{1}{x} \log_a e, x > 0$	$\int \frac{1}{x} dx = \ln x + C, C \in \mathbb{R}$
$(\ln x)' = \frac{1}{x}, x > 0$	$\int e^x dx = e^x + C, C \in \mathbb{R}$
$(a^x)' = a^x \ln a, x \in \mathbb{R}$	$\int a^x dx = \frac{a^x}{\ln a} + C, C \in \mathbb{R}$
$(e^x)' = e^x, x \in \mathbb{R}$	$\int \sin x dx = -\cos x + C, C \in \mathbb{R}$
$(\sin x)' = \cos x, x \in \mathbb{R}$	$\int \cos x dx = \sin x + C, C \in \mathbb{R}$
$(\cos x)' = -\sin x, x \in \mathbb{R}$	$\int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + C, C \in \mathbb{R}$
$(\operatorname{arctg} x)' = \frac{1}{1+x^2}, x \in \mathbb{R}$	$\int \frac{1}{a^2+x^2} dx = \frac{1}{a} \operatorname{arctg} \frac{x}{a} + C, C \in \mathbb{R}$