

odgovornosti studenata. **PIŠITE JEDNOSTRANO!**

IME I PREZIME:

VICE VIŠIĆ

BROJ INDEKSA:

57102

1. Izračunati volumen područja između plašta stošca $x^2 + y^2 = z^2$ i plašta paraboloida $x^2 + y^2 = 5z$.
2. Izračunati $\iint_{\partial K} \mathbf{F} \cdot d\mathbf{S}$ gdje je $\mathbf{F} = \begin{pmatrix} 3x + z^{77} \\ y^2 - \sin(x^2 z) \\ xz + ye^{x^5} \end{pmatrix}$ i ∂K rub kvadra $K = \{(x, y, z) : 0 \leq x \leq 1, 0 \leq y \leq 3, 0 \leq z \leq 2\}$ koji je orijentiran vanjskom normalom.
3. Riješiti $x'''(t) + 3x'(t) = t$, $x'(0) = x''(0) = 0$, $x(0) = 1$.
4. Izračunati krivuljni integral skalarnog polja $f(x, y, z) = x + z$ po luku krivulje C zadane sa $x = 2t$, $y = t^2$ i $z = \frac{1}{3}t^3$ ako je $0 \leq t \leq 10$.
5. Zadan je X krug radijusa 3 oko točke $T(1, 0)$ i $f(x, y) = xy$. Izračunati $\iint_X f$.

Ukupno:

1. $x^2 + y^2 = z^2$
 $r = \sqrt{z^2}$
 ~~$r = \sqrt{z^2}$~~
 $r = z$

$x^2 + y^2 = 5z$
 ~~$r = \sqrt{5z}$~~
 ~~$r = \sqrt{5z}$~~
 $z = \sqrt{5z}$

$\theta \in [0, 2\pi]$ GRANICA INTEGRACIJE
 VARIABLE z
 $r \in [0, 1]$ NE SMIJE OVISITI
 $z \in [0, \sqrt{5z}]$ O VARIJABLI z .

$$V = \int_0^{2\pi} d\theta \int_0^{\sqrt{5z}} dz \int_0^z r dr = \int_0^{2\pi} d\theta \int_0^{\sqrt{5z}} dz \int_0^z r dr = \int_0^{2\pi} d\theta \int_0^{\sqrt{5z}} \frac{r^2}{2} \Big|_0^z dz$$

3. $x'''(t) + 3x'(t) = t$ $x'(0) = x''(0) = 0$ $x(0) = 1$

$$\Delta^3 X(t) - \Delta^2 X(t) - \Delta X'(t) - X''(t) + 3 \cdot \Delta X(t) - X(t) = \frac{1}{2} t^2$$

$$\Delta^3 X(t) - \Delta^2 + 3 \Delta X(t) - 3 = \frac{1}{2} t^2$$

$$\Delta^3 X(t) + 3 \Delta X(t) = \frac{1}{2} t^2 + \Delta^2 + 3$$

$$\Delta^3 X(t) + 3 \Delta X(t) = \frac{1 + t^4 + 3t^2}{\Delta^2}$$

$$X(t) (\Delta^3 + 3\Delta) = \frac{1 + t^4 + 3t^2}{\Delta^2}$$

$$X(t) = \frac{1 + t^4 + 3t^2}{\Delta^2} \cdot \frac{1}{\Delta^3 + 3\Delta} = \frac{1 + t^4 + 3t^2}{\Delta^2 (\Delta^3 + 3\Delta)} = \frac{1 + t^4 + 3t^2}{\Delta^2 (\Delta^2 + 3\Delta)}$$

$$1 + t^4 + 3t^2 = \frac{A}{\Delta^3} + \frac{B}{\Delta} + \frac{C\Delta + D}{\Delta^2 + 3\Delta} = A(\Delta^2 + 3\Delta) + B\Delta^2(\Delta^2 + 3\Delta) + (C\Delta + D)\Delta^3$$

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$$4\Delta^4 + 3\Delta^2 = A\Delta^2 + 3A\Delta + B\Delta^4 + 3B\Delta^3 + C\Delta^4 + D\Delta^3$$

$$(B+C)\Delta^4 + (3B+D)\Delta^3 + (A)\Delta^2 + (3A)\Delta$$

$$C+B=1$$

$$3B+D=0 \Rightarrow 3B+D=0 \Rightarrow C=1$$

~~AA=0~~

$$A=3$$

$$B=0$$

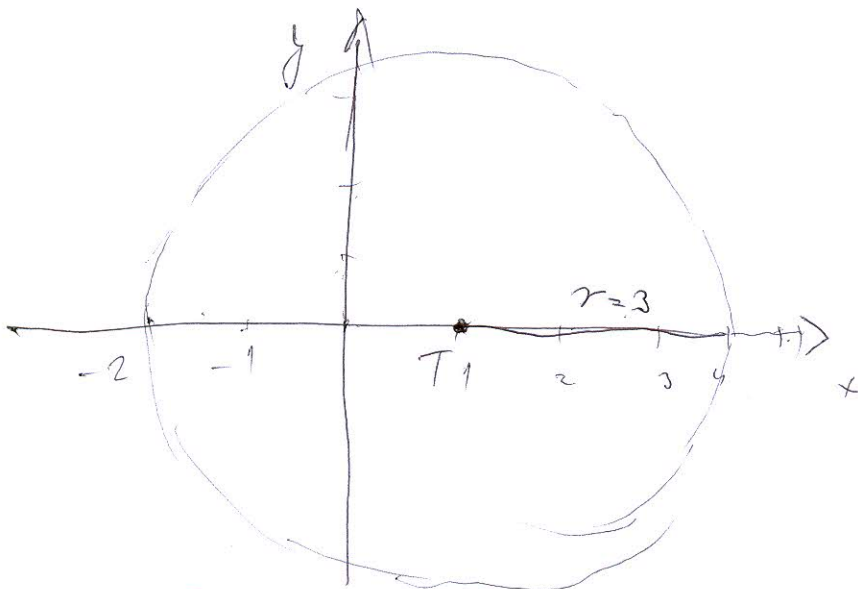
$$A=3$$

$$D=0$$

$$3 \cdot \frac{1}{\Delta^3} + \frac{0}{\Delta} + \frac{1}{\Delta^2+3} = t \cdot \frac{1}{\Delta} + t \cdot \frac{1}{3} = \frac{1}{3}t + 0 + \cancel{\Delta^2}$$

X ~~Ø~~

5. $r=3$ $T(1,0)$; $f(x,y) = xy$



$$\int_0^{2\pi} d\theta \int_1^3 r dr$$

X ~~Ø~~