Odmah popuniti ↓

IME I PREZIME: Toni Prenda BROJ INDEKSA: 53465 (10)

OBAVEZNO POPUNITI VRIJEME RJEŠAVANJA ISPITA: DATUM OD DO .

MATEMATIKA 3: Trajanje 100 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. ooxo

1. Izračunati dvostruki integral:

$$\iint\limits_S (x+y)\,\mathrm{d}x\mathrm{d}y\,,$$

gdje je S područje gornje poluravnine ($y \geq 0$) omeđeno kružnicom $(x-1)^2 + y^2 = 1$. ~~0~~

2. Izračunati $\int_{\widehat{ABC}} x\mathrm{d}x + y\mathrm{d}y + z\mathrm{d}z$ gdje je $\widehat{ABC}$ krivulja koja ide bridovima trokuta s vrhovima $A(0,0,0)$, $B(0,0,1)$, $C(0,1,0)$ usmjerena redom od vrha A preko B i C do ponovo vrha A. Koristiti Stokesovu formulu. 10

3. Izračunati volumen tijela omeđenog valjkom $x^2 + y^2 = 4$ i ravninama $y + 1 = z$ i $y + 2 = z$.

4. Izračunati

$$\int\limits_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,\mathrm{d}x + z^2\cos y\,\mathrm{d}y + 2z\sin y\,\mathrm{d}z$$ ~~0~~

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$x'''(t) - x''(t) = \mathrm{e}^t, \quad x'(0) = x''(0) = -1,\ x(0) = 0.$$ ~~0~~

IME I PREZIME: TONI PRENDA BROJ INDEKSA: 53465

5. $x'''(t) - x''(t) = e^t \qquad x'(0) = x''(0) = -1 \quad , x(0) = 0$

$s^3X(s) - s^2\cancel{x(0)} - sx'(0) - x''(0) - \left(s^2X(s) - s\cancel{x(0)} - x'(0)\right) = \frac{1}{s-1}$

$s^3X(s) + s + 1 - \left(s^2X(s) + 1\right) = \frac{1}{s-1}$

$X(s)(s^3 - s^2) = \frac{1}{s-1} - s - 2$

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

$X(s)(s^3 - s^2) = \frac{-s^2 - s + 3}{s-1} \quad / : (s^3 - s^2)$

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

$\frac{-s^2 - s + 3}{s^2(s^2+1)} = \frac{A}{s^2} + \frac{B}{s} + \frac{Cs + D}{s^2+1}$

$-s^2 - s + 3 = A(s^2+1) + Bs(s^2+1) + Cs^3 + Ds^2$

$-s^2 - s + 3 = As^2 + A + Bs^3 + Bs + Cs^3 + Ds^2$

$0 = B + C \Rightarrow 0 = -1 + c \qquad \boxed{C = 1}$

$-1 = A + D \Rightarrow -1 = 3 + D \Rightarrow \boxed{D = -4}$

$-1 = B \Rightarrow \boxed{B = -1}$

$3 = A \Rightarrow \boxed{A = 3}$

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

$\frac{s}{s^2+1} = \frac{s}{s^2 + (\sqrt{1})^2} = \cos\sqrt{1}t$

$\left(\frac{1}{4}\right)\frac{-4}{s^2+1} = \frac{4}{s^2 + (\sqrt{1})^2}$

~~$X(s) = \mathcal{L}^{-1}\left\{3 \cdot \frac{1}{s^2}\right\} - \mathcal{L}^{-1}\left\{1 \cdot \frac{1}{s}\right\} + \mathcal{L}^{-1}\left\{\frac{1}{\sqrt{1}} \cdot \frac{s}{s^2 + (\sqrt{1})^2} - 4\right\}$~~

$X(s) = \mathcal{L}^{-1}\left\{3 \cdot \frac{1}{s^2}\right\} - \mathcal{L}^{-1}\left\{1 \cdot \frac{1}{s}\right\} + \mathcal{L}^{-1}\left\{\frac{s}{s^2 + (\sqrt{1})^2} - \frac{4}{s^2 + (\sqrt{1})^2}\right\}$ $\cdot\frac{1}{4}$

~~$x(s) = 3 \cdot t - 1 + \cos(\sqrt{1})t - 4$~~

$x(s) = 3t - 1 + \cos(\sqrt{1}t) - \frac{1}{4}\sin(\sqrt{1}t)$

PREVIŠE GREŠAKA $\emptyset$

$\frac{1s - 4}{s^2+1}$

$B = -1$

$A = \frac{1}{3}$

$-1 = \frac{1}{3} + D$

$D = \frac{1}{3} + 1$

$D = \frac{4}{3}$

$-1 = 3 \cdot \frac{1}{3} + D$

$3 = \frac{?}{3} - 1 \qquad -\frac{3}{3}$

$-1 = 3 + D$

$D =$

Ime i prezime: TONI PRENDA

Broj indeksa: 53465

2.

$$\int_{\overrightarrow{ABC}} x\,dx + y\,dy + z\,dz$$

A(0,0,0)
B(0,0,1)
C(0,1,0)

$\cancel{\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x} \quad \frac{\partial P}{\partial z} = \frac{\partial R}{\partial x} \quad \frac{\partial Q}{\partial z} = \frac{\partial R}{\partial y}}$

$\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x} \quad \frac{\partial P}{\partial z} = \frac{\partial R}{\partial x} \quad \frac{\partial Q}{\partial z} = \frac{\partial R}{\partial y}$

$W = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ ✓ $= \cancel{\text{grad } W = \nabla \times W}$ grad W ?

×

$$W = \begin{bmatrix} dx & x \\ dy & y \\ dz & z \\ dx & x \\ dy & y \end{bmatrix} = \begin{bmatrix} z\,dy - dz\,y \\ x\,dz - dx\,z \\ y\,dx - dy\,x \end{bmatrix} = \begin{bmatrix} 0 - 0 \\ 0 - 0 \\ 0 - 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

$$\Gamma(x,y,z) = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} ? = \Gamma(y,z)_{x=0} = \begin{bmatrix} 0 & 0 \\ 0 & 1 \\ 1 & 0 \\ 0 & 0 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 - 1 \\ 0 - 0 \\ 0 - 0 \end{bmatrix}$$

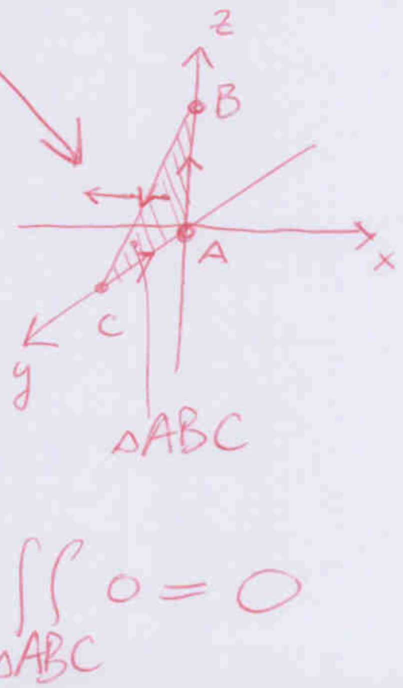
$$= \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix}$$ ✓

~~normala~~
NORMALA NA $\triangle ABC$

$\text{rot } w = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

10

$$W \int_{\overrightarrow{ABC}} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \cdot \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix} = -1+0+0 = -1$$



STOKESOVA FORMULA

$$\int_{\partial S} (w \mid dr) = \iint_{S} (\text{rot } w \mid dS)$$ NORMALA

$$= \iint_{\triangle ABC} \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \cdot \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix} = \iint_{\triangle ABC} 0 = 0$$

IME I PREZIME: TONI PRENDA BROJ INDEKSA: 53465

4. $$\int_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,dx + z^2\cos y\,dy + 2z\sin y\,dz$$ Rj [0]

OVO JE ROT (W)

$$W = \begin{bmatrix} x \\ z^2\cos y \\ 2z\sin y \end{bmatrix} \stackrel{?}{=} \operatorname{grad} W = \begin{bmatrix} dx & x \\ dy & z^2\cos y \\ dz & 2z\sin y \\ dx & x \\ dy & z^2\cos y \end{bmatrix} = \begin{bmatrix} 2z\sin y\,dy - z^2\cos y\,dz \\ x\,dz - 2z\sin y\,dx \\ z^2\cos y\,dx - x\,dy \end{bmatrix}$$

$$= \begin{bmatrix} 0 - 0 \\ 0 + \cos y 2z \\ 2z\cos y - 0 \end{bmatrix} = \begin{bmatrix} 0 \\ \cos y 2z \\ \cos y\, 2z \end{bmatrix}$$

$$\cancel{\begin{bmatrix} 0 \\ \cos y \\ 2z \end{bmatrix}} \cdot \begin{bmatrix} 1 & 1 \\ 2\pi & \pi \\ 0 & \pi \\ 1 & 1 \\ 2\pi & \pi \end{bmatrix} = \begin{bmatrix} 2\pi^2 - 0 \\ 0 - \pi \\ \pi - 2\pi \end{bmatrix} = \begin{bmatrix} 2\pi^2 \\ -\pi \\ -\pi \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ \cos y\, 2z \\ \cos y\, 2z \end{bmatrix} \cdot \begin{bmatrix} 2\pi^2 \\ -\pi \\ -\pi \end{bmatrix} = 0+0+0-2\pi\cos y 2z - \pi\cos y 2z - \pi\cos y 2z + 2\pi^2\cos y 2z - \pi\cos y\, 2z - \pi\cdot\cos y\, 2z$$

$$= -2\pi\cos y 2z + 2\pi^2\cos y 2z - 2\pi^2\cos y 2z + 2\pi^2\cos y 2z$$

$$= \begin{bmatrix} 0 \\ \cos y 2z \\ 2z\cos y \end{bmatrix} \cdot \begin{bmatrix} 2\pi^2 \\ -\pi \\ -\pi \end{bmatrix} = 0+0+0 - \cancel{\cos 2\pi^2 y} + \cancel{\cos\pi y - \cos y\pi}) + \cancel{2\pi^2 z} - 2\pi z - 2\pi z$$

$$\cancel{2\pi^2\cos y \left(\cos y\pi - \cos y\pi\right) \quad 2\pi^2 2z - \pi 2z - \pi 2z}$$

$$= \cancel{2\pi^2\cos y} - 2\cos\pi y + 2\pi^2 2z - 2\pi 2z = 0$$

$= 0$

1. $$\iint_S (x+y)\,dx\,dy$$

$(x-1)^2 + y^2 = 1$

$x = r\cdot\cos\varphi$

$y = r\cdot\sin\varphi$

$r = 1$

$(g-1)^2 - (\varphi+1)^2 = 1$

$r \in [0,1]$

$\varphi \in ($

?

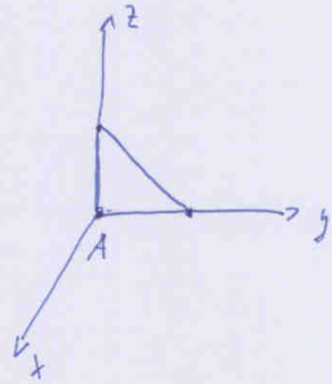
0

Ime i prezime: Toni Pronah Broj indeksa: 53465

2.

$$\int_{\overrightarrow{ABC}} \underbrace{x\,dx}_{P} + \underbrace{y\,dy}_{Q} + \underbrace{z\,dz}_{R}$$

A(0,0,0)
B(0,0,1)
C(0,1,0)



$$\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x} \qquad \frac{\partial P}{\partial z} = \frac{\partial R}{\partial x} \qquad \frac{\partial Q}{\partial z} = \frac{\partial R}{\partial y}$$

$$0 = 0 \qquad 0 = 0 \qquad 0 = 0$$

$$\cancel{\int_{x_0}^{x} x\,dx + \int_{y_0}^{y} y\,dy + \int_{z_0}^{z} z\,dz = 1+1+1=1}$$

DRUGI PUTA RJEŠAVAN ISTI ZADATAK

$$\frac{s}{s^2+1} \quad \frac{4}{s^2+1}$$

$$\frac{s}{s^2+(\sqrt{1})^2} = \cos(\sqrt{1})t \qquad \frac{4}{s^2+1} \cdot \frac{1}{4} \cdot 4$$

$$\begin{bmatrix} 0 & -0 \\ 0 & +\cos 2z \\ 2z\cos y & -0 \end{bmatrix} = \begin{bmatrix} 0 \\ \cos y\, 2z \\ a\cos y\, 2z \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 \\ 2\pi & \pi \\ 0 & \pi \\ 1 & 1 \\ 2\pi & \pi \end{bmatrix} = \cancel{2\pi^2 - 0 - \pi} \begin{bmatrix} 2\pi^2 - 0 \\ 0 - \pi \\ \pi - 2\pi \end{bmatrix} = \begin{bmatrix} 2\pi^2 \\ -\pi \\ -\pi \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ \cos y\, 2z \\ \cos y\, 2z \end{bmatrix} \cdot \begin{bmatrix} 2\pi^2 \\ -\pi \\ -\pi \end{bmatrix} = 0 + 0\ 0 - 2\pi^2 \cos y\, 2z - \pi\cos y\, 2z - \pi \cos y\, 2z + 2\pi^2 \cos y\, 2z - \pi \cos y\, 2z - \pi\cos y\, 2z$$

$$=$$

Odmah popuniti ↓

IME I PREZIME: INES TOMIĆ BROJ INDEKSA:

20

OBAVEZNO POPUNITI VRIJEME RJEŠAVANJA ISPITA: DATUM OD DO .

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4. Izračunati

$$\int_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,\mathrm{d}x + z^2\cos y\,\mathrm{d}y + 2z\sin y\,\mathrm{d}z$$ 0

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$x'''(t) - x''(t) = \mathrm{e}^t, \quad x'(0) = x''(0) = -1,\ x(0) = 0.$$ 20

IME I PREZIME: INES TOMIĆ BROJ INDEKSA:

5.) $x'''(t) - x''(t) = e^t$ $\quad x'(0) = x''(0) = -1$

$x(0) = 0$

$$x'''(t) \Rightarrow s^3 X(s) - \cancel{s^2 \cdot 0} + s + 1$$

$$x''(t) \Rightarrow s^2 X(s) - \cancel{s \cdot 0} + 1$$

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

$$X(s)(s^3 - s^2) = \frac{1}{s-1} - s \cancel{- 1 + 1}$$

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

$$X(s) = \frac{1 - s^2 + s}{(s^3 - s^2)(s-1)} = \frac{1 - s^2 + s}{s^2(s-1)(s-1)} = \frac{A}{s} + \frac{B}{s^2} + \frac{C}{s-1} + \frac{D}{(s-1)^2}$$

$s^3 - s^2 - s^2 + s$ $\quad s^2 - 2s + 1$

$(s^2 - s)(s-1)$ $\quad s^2 - s - s + 1$

$$1 - s^2 + s = A\,s(s-1)(s-1) + B(s-1)(s-1) + C\,s^2(s-1) + D\,s^2$$

$$1 - s^2 + s = As^3 - 2As^2 + As + Bs^2 - 2Bs + B + Cs^3 - Cs^2 + Ds^2$$

$A + C = 0$

$-2A + B - C + D = -1$

$A - 2B = 1$ $\quad \boxed{B = 1}$

$A - 2 = 1$

$A = 1 + 2$

$\boxed{A = 3}$

$A + C = 0$

$3 + C = 0$

$\boxed{C = -3}$

$\boxed{D = 1}$

$-2 \cdot 3 + 1 + 3 + D = -1$

$-6 + 1 + 3 + D = -1$

$D = -1 + 6 - 1 - 3 = 1$

IME I PREZIME: INES TOMIĆ BROJ INDEKSA:

$x'(t) = 1 - 3e^t + e^t + te^t$
$= 1 - 2e^t + te^t$
$x''(t) = -e^t + te^t$
$x'''(t) = te^t$

$$= 3 \cdot \frac{1}{s} + 1 \cdot \frac{1}{s^2} - 3\,\frac{1}{s-1} + 1\,\frac{1}{(s-1)^2}$$

$x(0) = 3 + 0 - 3 + 0 = 0$ ✓
$x'(0) = 1 - 2 + 0 = -1$ ✓
$x''(0) = -1 + 0 = -1$ ✓

$$x(t) = 3 + t - 3e^t + te^t \checkmark$$

$x'''(t) - x''(t) = \cancel{te^t} - (-e^t + \cancel{te^t}) = e^t$ ✓

20

2.) $$\begin{vmatrix} x \\ y \\ z \end{vmatrix} \times \begin{vmatrix} dx \\ dy \\ dz \end{vmatrix} = \begin{vmatrix} 0-0 \\ 0-0 \\ 0-0 \end{vmatrix} = 0 \qquad \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \neq 0$$

OVO NIJE NORMALA NA $\triangle ABC$

$$\begin{vmatrix} 0 \\ 0 \\ 0 \end{vmatrix} \times \begin{vmatrix} 0 \\ 0 \\ 1 \end{vmatrix} = \begin{vmatrix} 0 \\ 0 \\ 0 \end{vmatrix} = 0$$

VEKTORSKI UMNOŽAK?

$$\int w/ds = 0$$

REZULTAT JE TOČAN, ALI POSTUPAK NIJE

VIDI PRENDA

$\cancel{0}$

4.) $$\int_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,dx + z^2\cos y\,dy + 2z\sin y\,dz =$$

$$f(1,\pi,\pi) - f(1,2\pi,0) = 0\ ?$$

POSTUPAK? $\cancel{0}$

x
$z^2\cos y$
$2z\sin y$

$f = ?$

Odmah popuniti ↓

Ime i prezime: MARKO BUBIČIĆ **Broj indeksa:** 54768-2007

Obavezno popuniti vrijeme rješavanja ispita: datum 22.9.2011 od 8h 10min do 9h 40min

MATEMATIKA 3: Trajanje 100 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. ooxo

1. Izračunati dvostruki integral:

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3. Izračunati volumen tijela omeđenog valjkom $x^2 + y^2 = 4$ i ravninama $y + 1 = z$ i $y + 2 = z$.

4. Izračunati

$$\int\limits_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,\mathrm{d}x + z^2\cos y\,\mathrm{d}y + 2z\sin y\,\mathrm{d}z$$

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$x'''(t) - x''(t) = \mathrm{e}^t, \quad x'(0) = x''(0) = -1,\, x(0) = 0.$$

$\varnothing$

Ime i prezime: MARKO BUBIČIĆ **Broj indeksa:** 54768-2007

(5) $x'''(t) - x''(t) = e^t$

$x'(0) = x''(0) = -1$
$x(0) = 0$

$s^3 X(s) - \cancel{s^2 x(0)} - s x'(0) - x''(0) - \left(s^2 X(s) - \cancel{s x(0)} - x'(0)\right) = \frac{1}{s-1}$

$s^3 X(s) + s + 1 - \left(s^2 X(s) + 1\right) = \frac{1}{s-1}$

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

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

$X(s)(s^3 - s^2) = \frac{1}{s-1} - s$

$X(s)\, s^2 (s-1) = \frac{1 - s^2 + s}{s-1} \quad / : s^2(s-1)$

VIDI TOMIĆ

$X(s) = \frac{1 - s^2 + s}{s^2 (s-1)(s-1)} = \frac{A}{s^2} + \frac{B}{s-1} + \frac{C}{s-1}$ X

$1 - s^2 + s = As - A + As - A + Bs^2 + Bs - B + Cs^2 + Cs - C$

$-1 = B + C \Rightarrow B = -1 - C$ $\quad -1 = B + C \quad /(-1)$

$1 = 2A + B + C$ $\quad 1 = 2A + B + C$

$1 = -2A - B - C$ $\quad 1 = -\cancel{B} - \cancel{C}$

$1 = 2A + \cancel{B} + \cancel{C}$

$2A = 2$

$\boxed{A = 1}$

$-1 = B + \cancel{C}$

$1 = 2A - 1 - \cancel{C} + C$

$\boxed{B = 0}$?

$\boxed{C = -1}$

PREVIŠE GREŠAKA

$X(s) = \frac{1}{s^2} - \frac{1}{s-1}$

PROVJERA?

$x(t) = t - e^t$

Odmah popuniti ↓

IME I PREZIME: MATIJA ŠKIBOLA BROJ INDEKSA: S4961 /2007

OBAVEZNO POPUNITI VRIJEME RJEŠAVANJA ISPITA: DATUM 22.09. OD DO

MATEMATIKA 3: Trajanje 100 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. ooxo

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$$\int_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,\mathrm{d}x + z^2\cos y\,\mathrm{d}y + 2z\sin y\,\mathrm{d}z$$

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$x'''(t) - x''(t) = \mathrm{e}^t, \quad x'(0) = x''(0) = -1,\ x(0) = 0.$$

$$\int_{(1,2\pi,0)}^{(1,\pi,\pi)} x\,dx + z^2\cos y\,dy + 2z\sin y\,dz$$

Odmah popuniti ↓

IME I PREZIME: ANTONIO NARANČIĆ BROJ INDEKSA: 53803/2006.

OBAVEZNO POPUNITI VRIJEME RJEŠAVANJA ISPITA: DATUM 22.09.2011 OD DO

MATEMATIKA 3: Trajanje 100 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. ooxo

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Ime i prezime: ANTONIO NARANČIĆ Broj indeksa:

② $\int_{\overrightarrow{ABC}} x\,dx + y\,dy + z\,dz$ $A(0,0,0)$ $B(0,0,1)$ $C(0,1,0)$

od vrha A preko B i C ponovo do vrha A. Stokesova formula.