Odmah popuniti ↓

Ime i prezime: JAKŠA BLITVIĆ **Broj indeksa:** 54805 40

Obavezno popuniti vrijeme rješavanja ispita: datum 22.09.2011 od 08,20 do .

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

1. Primjenom Greenove formule izračunati integral

$$\oint_C y^2 \mathrm{d}x + (x+y)^2 \mathrm{d}y\,,$$

gdje je C kontura trokuta $A(0,0)$, $B(2,2)$ i $C(1,3)$ prijeđena u pozitivnom smislu (suprotno od kazaljke na satu).

1

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2. Izračunati $\iint_{\partial K} \mathbf{F}\cdot \mathrm{d}\mathbf{S}$ gdje je $\mathbf{F} = \begin{pmatrix} x^2+y^2 \\ z \\ 1 \end{pmatrix}$ i ∂K rub kugle K radijusa 1 s centrom u točki $T(2,1,0)$, a koji je orijentiran vanjskom normalom.

3. Izračunati volumen tijela omeđenog plohama: $x^2+y^2+z^2=25$, $z=4$.

20

4. Izračunati

$$\int_{(1,\pi)}^{(2,3\pi)} 2x\sin y\,\mathrm{d}x + (x^2+1)\cos y\,\mathrm{d}y$$

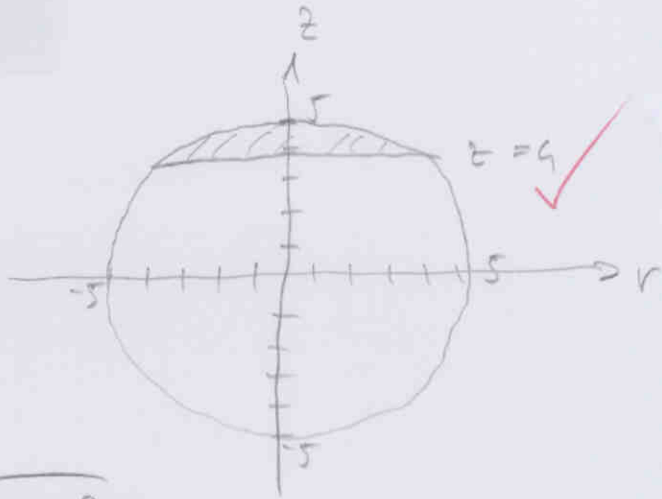
Ø

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$f'''(t) - 4\,f'(t) = \cos(2t)\,, \quad f(0) = f'(0) = f''(0) = 0.$$

Ø

3 $x^2+y^2+z^2=25$ $z=4$



$x = r\cos f$

$y = r\sin f$

$(r\cos f)^2 + (r\sin f)^2 + z^2 = 25$

$r^2\cos^2 f + r^2 \sin^2 f + z^2 = 25$

$r^2 \underbrace{(\cos^2 f + \sin^2 f)}_{1} + z^2 = 25$

$r^2 + z^2 = 25$ ✓ $r = \sqrt{25-z^2}$

$r \in [0,5]$ ×

$f \in [0, 2\pi]$

$z \in [0, \sqrt{25-z^2}]$ ×

$V = \int_4^5 dz \int_0^{2\pi} df \int_0^{\sqrt{25-z^2}} r\,dr$ ✓ ✓ ✓

$V = \int_4^5 dz \int_0^{2\pi} df \left(\frac{r^2}{2}\right)\Big|_0^{\sqrt{25-z^2}}$ ✓

Ime i prezime: JAKŠA BLITVIĆ **Broj indeksa:** 54805

$$V = \int_4^5 dz \int_0^{2\pi} d\varphi \left(\frac{\sqrt{25-z^2}}{2}\right)^2$$

NASTAVAK 1 ZADATKA

2

$$V = \int_4^5 dz \int_0^{2\pi} d\varphi \frac{25-z^2}{2} = \frac{1}{2}\int_4^5 dz \left.(25-z^2)\varphi\right|_0^{2\pi}$$

$$V = \frac{1}{2}\int_4^5 dz\,(25-z^2)\cdot 2\pi = 2\pi\cdot\frac{1}{2}\int_4^5 (25-z^2)\,dz$$

$$\pi\left(25z - \frac{z^3}{3}\right)\Big|_4^5 \checkmark = \pi\left(\left(25\cdot 5 - \frac{5^3}{3}\right) - \left(25\cdot 4 - \frac{4^3}{3}\right)\right) \checkmark$$

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$$V = \pi\left(\left(125 - \frac{125}{3}\right) - \left(100 - \frac{64}{3}\right)\right)$$

$$V = \pi\left(125 - \frac{125}{3} - 100 + \frac{64}{3}\right)$$

$$V = \pi\left(25 - \frac{61}{3}\right)$$

$$V = 4\frac{2}{3}\pi$$

- RJEŠENJE

Ime i prezime: JAKŠA BLITVIĆ Broj indeksa: 54805 3

5 $f'''(t) - 4f'(t) = \cos(2t)$ $f(0) = f'(0) = f''(0) = 0$

$f'''(t) \circ\!-\!\bullet\ s^3 F(s) - s^2 f(0) - s f'(0) - f''(0)$ 0 0 0

$\boxed{s^3 F(s)}$

$f'(t) \circ\!-\!\bullet\ -4\left(sF(s) - f(0)\right)$ 0

$\boxed{-4sF(s)}$

$\cos(2t) \circ\!-\!\bullet\ \frac{2}{s^2+2^2}$?

$\frac{s}{s^2+2^2}$

$s^3F(s) - 4sF(s) = \frac{2}{s^2+2^2}$

$F(s)\left(s^3-4s\right) = \frac{2}{s^2+4} \quad / : s^3-4s$

$F(s) = \frac{2}{(s^2+4)(s^3-4s)}$

$F(s) = \frac{2}{(s^2+4)(s^3-4s)} = F(s) = \frac{2}{s^5 - \cancel{4s^3} + \cancel{4s^3} - 16s}$

IME I PREZIME: SAŠA BLITVIĆ BROJ INDEKSA: 54805

NASTAVAK 5 ZADATKA!

4

$$F(s) = \frac{2}{s^5-16s} = F(s) = \frac{2}{s(s^4-16)}$$

$= (s^2-4)(s^2+4)$
$= (s-2)(s+2)(s^2+4)$

$$2 = \frac{A}{s} + \frac{Bs^3+C}{s^4-16} \quad / \cdot s(s^4-16)$$

$$2 = A(s^4-16) + (Bs^3+C)(s)$$

$$2 = \underline{As^4}_{0} - 16A + \underline{Bs^4}_{0} + \underline{Cs}_{0}$$

$0 = A + B$

$0 = C$

$2 = -16A$

$\boxed{A = -8}$ $\boxed{B = 8}$

$$4 \cdot \frac{2}{s^4 - 2^4}$$

$$F(s) \circ\!\!-\!\!\circ f(t) = \frac{-8}{s} + \frac{8+0}{s^4-16} =$$

$$F(s) \circ\!\!-\!\!\circ f(t) = -8 + 4 \cdot \sin(2t)$$ ✗

RIJEŠENJE

PREVIŠE GREŠAKA $\emptyset$

Ime i prezime: JAKŠA BLITVIĆ **Broj indeksa:** 54805

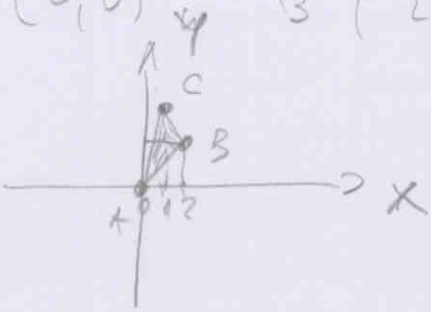
(1) $\oint_C y^2 dx + (x+y)^2 dy$ $\iint_D \left(\frac{dQ}{dx} - \frac{dP}{dy}\right) dx dy = \oint_C P dx + Q dy$

$Q = (x+y)^2 = x^2 + 2xy + y^2 \rightarrow \frac{dQ}{dx} = 2x + 2y$

$P = y^2 \rightarrow \frac{dP}{dy} = 2y$ ✓

5

$A(0,0)$ $B(2,2)$ $C(1,3)$



$A\overset{x_1 y_1}{(0,0)}$ $B\overset{x_2 y_2}{(2,2)}$

$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$

$y - 0 = \frac{2-0}{2-0}(x-0)$

$\boxed{y = x}$

$A\overset{x_1 y_1}{(0,0)}$ $C\overset{x_2 y_2}{(1,3)}$

$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$

$y - 0 = \frac{3-0}{1-0}(x-0)$

$\boxed{y = 3x}$

$B\overset{x_1 y_1}{(2,2)}$ $C\overset{x_2 y_2}{(1,3)}$

$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$

$y - 2 = \frac{3-2}{1-2}(x-2)$

$y - 2 = -x + 2$

$\boxed{y = -x + 4}$

→

Ime i prezime: SARTA BLITVIĆ **Broj indeksa:** ~~35~~ 54805 (6)

nastavak 1 zadatka |

$$\int_1^2 dx \int_x^{-x+4} \underbrace{(2x+2y)-2y}_{=2x}\, dy + \int_0^1 dx \int_x^{3x} \underbrace{(2x+2y)-2y}_{2x}\, dy$$

Prvi dio — drugi dio

$$\int_1^2 dx \int_x^{-x+4} (2x+\cancel{2y})-\cancel{2y}\, dy = \int_1^2 dx \int_x^{-x+4} 2x\, dy$$

$$\int_1^2 dx\ 2x(y)\Big|_x^{-x+4} = \int_1^2 dx\ 2x\cdot((-x+4)-(x))$$

$$\int_1^2 dx\ 2x((-x+4-x)) = \int_1^2 2x(-2x+4)\, dx$$

$$\int_1^2 -4x^2+8x\, dx = -4\frac{x^3}{3} + \cancel{8}\frac{x^2}{\cancel{2}}\Big|_1^2$$

$$= -\frac{4}{3}x^3 + 4x^2\Big|_1^2 = \left(-\frac{4}{3}2^3 + 4\cdot(2)^2\right) - \left(-\frac{4}{3}1^3 + 4\cdot 1^2\right)$$

$$\left(-\frac{4}{3}\cdot 8 + 16\right) - \left(-\frac{4}{3} + 4\right) = -10\frac{2}{3} + 16 + \frac{4}{3} - 4$$

$$= -9\frac{1}{3} + 12 = 2\frac{2}{3}$$

Prvi dio

IME I PREZIME: SAŠA BLITVIĆ BROJ INDEKSA: 54805 7

nastavak 1 zadatka

drugi dio

$$\int_0^1 dx \int_x^{3x} (2x+2y)(-2y)\,dy = \int_0^1 dx \int_x^{2x} 2x\,dy$$

$$\int_0^1 dx\; 2xy \Big|_x^{2x} = \int_0^1 dx\; 2x(2x-x)$$

$$\int_0^1 dx\; 4x^2 - 2x^2 = \int_0^1 2x^2\,dx$$

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$$\frac{2x^3}{3}\Big|_0^1 = \frac{2}{3}x^3\Big|_0^1 = \frac{2}{3}\cdot 1^3$$

$$\frac{2}{3}\cdot 1 = \frac{2}{3}$$ drugi dio

RJEŠENJE

$$2\frac{2}{3} + \frac{2}{3} = 3\frac{1}{3}$$

RJEŠENJE

IME I PREZIME: JAGODA BLITVIĆ BROJ INDEKSA: 54805

8

$$\int_{(1,\pi)}^{(2,3\pi)} 2x\sin y\,dx + (x^2+1)\cos y\,dy$$

$dx\,f = 2x\sin y$

$f = x^2\cos y\,\omega$

$dy\,f = (x^2+1)\cos y$

$f = (x^2+1) - \sin y\,\omega$

$$\int_{1,\pi}^{2,3\pi} x^2 \cancel{\cos y} + (x^2+1) - \cancel{\sin y}$$

$$\int_{1,\pi}^{2,3\pi} x^2 + x^2+1+1$$

$$\int_{1,\pi}^{2,3\pi} 2x^2+2+2\cos y = (2\cdot 2^2+2+2\cos 3\pi) - (2\cdot 1^2+2+2\cos\pi)$$

$= 11{,}97 - 5{,}99 = 5{,}98$

ovo

$$\int_{1,\pi}^{2,3\pi} x^{\cancel{2}} - \cancel{\sin y + \cos y} + 1$$

$$\int_{1,\pi}^{2,3\pi} x^2+2$$

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

$= 6 - 3$

$= 3$

VIPI VOLIĆ KERO

Odmah popuniti ↓

IME I PREZIME: Jure Mažić BROJ INDEKSA: 52915-2005 15

OBAVEZNO POPUNITI VRIJEME RJEŠAVANJA ISPITA: DATUM OD DO .

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5)

$$s^3F(s) - s^2f(0) - sf'(0) - f''(0) - 4\left[sF(s) - f(0)\right] = \frac{s}{s^2+4}$$

$$s^3F(s) - 4sF(s) = \frac{s}{s^2+4}$$

$(s-2)(s^2+4)$

$s^3+4s-2s^2-8$

$$F(s)\underbrace{(s^3-4s)}_{s(s^2-4)} = \frac{s}{s^2+4}$$ ✓

$$F(s) = \frac{s}{s(s-2)(s+2)(s^2+4)} = \cancel{\frac{A}{s}} + \frac{B}{(s-2)} + \frac{C}{(s+2)} + \frac{Ds+E}{s^2+4}$$

$$= As^4 - 16A + Bs(s+2)(s^2+4) + Cs(s-2)(s^2+4) + (Ds^2+Es)(s^2-4)$$

$$= As^4 - 16A + \cancel{Bs^4} + \cancel{4Bs^2} + 2Bs^3 + \cancel{8Bs} + \cancel{Cs^4} + \cancel{4Cs^2} - \cancel{2Cs^3} - \cancel{8Cs} + \cancel{Ds^4} - \cancel{4Ds^2}$$
$$+ \cancel{Es^3} - \cancel{4Es}$$

IME I PREZIME: Jure Mazić BROJ INDEKSA: 52915-2005

$s^4(\cancel{A}+B+C+D)=0$

$s^3(2B-2C+E)=0$

$s^2(4B+4C-4D)=0$

$s(8B-8C-4E)=1$

$-16A=0$ $\boxed{A=0}$ ✓

$\boxed{C=-\frac{1}{32}}$ ✓

$\boxed{B=\frac{1}{32}}$ ✓ $\boxed{D=0}$ ✓

$\boxed{E=-\frac{1}{4}}$ ✗ $E=-\frac{1}{8}$

$2B-2C+E=0 \quad /\cdot 4$

$8B-8C-4E=1$

$8B-8C+\cancel{4E}=0$

$8B-8C\cancel{-4E}=1$

$16B-16C=1$

$16B=16C+1$

$\boxed{B=C+\frac{1}{16}}$

$B+C+D=0 \quad /\cdot 4$

$4B+4C-4D=0$

$4B+4C+\cancel{4D}=0$

$4B+4C\cancel{-4D}=0$

$\boxed{B=-C}$

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$\frac{1}{16} \quad \times\frac{1}{8} \quad \frac{2}{s^2+4}$

$F(s)=\frac{1}{32}\cdot\frac{1}{s-2}-\frac{1}{32}\cdot\frac{1}{s+2}-\frac{\frac{1}{4}\;/\cdot 2}{s^2+4\;/\cdot 2}$ $\times\frac{1}{8}$

$f(t)=\frac{1}{32}\cdot e^{2t}-\frac{1}{32}\cdot e^{-2t}-\frac{1}{8}\cdot\sin(2t)$ $\times 16$

PROVJERA $\boxed{f(0)=0}$

$f(0)=\frac{1}{32}-\frac{1}{32}-\frac{1}{8}\sin(0)=0$ ✓

PROVJERA $\boxed{f'(0)=0}$

PROVJERA $f'(t)=\frac{1}{16}e^{2t}+\frac{1}{16}e^{-2t}-\frac{1}{4}\cos(2t) \Rightarrow f'(0)=\frac{1}{16}+\frac{1}{16}-\frac{1}{4}=-\frac{1}{8}$ ✗

PROVJERA $\boxed{f''(0)=0}$

$f''(t)=\frac{1}{8}e^{2t}-\frac{1}{8}e^{-2t}+\frac{1}{2}\sin(2t) \Rightarrow f''(0)=\frac{1}{8}-\frac{1}{8}+\frac{1}{2}\cdot 0=0$ ✓

$f'''(t)=\frac{1}{4}e^{2t}+\frac{1}{4}e^{-2t}+\cos(2t)$

PROVJERA: $f'''(t)-4f'(t)=\cos(2t)$ ✗

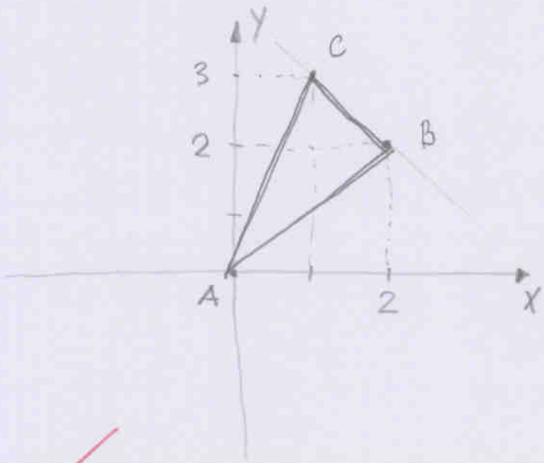
$\left(\cancel{\frac{1}{4}e^{2t}+\frac{1}{4}e^{-2t}}+\cos(2t)\right)-4\left(\cancel{\frac{1}{16}e^{2t}+\frac{1}{16}e^{-2t}}-\frac{1}{4}\cos(2t)\right)=\cos(2t)+\cos(2t)=2\cos(2t)$

Ime i prezime: Jure Mažić **Broj indeksa:** 52915-2005

1)

2y

$$\oint_C \overbrace{y^2}^{P} dx + \overbrace{(x+y)^2}^{Q} dy$$



$$\iint \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dx\,dy$$ ✓

DALJE? $\cancel{O}$

VIDI BLITVIĆ

Odmah popuniti ↓

Ime i prezime: IVAN KERO **Broj indeksa:** 56434 0269029457 20

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. ooox

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2. Izračunati $\iint\limits_{\partial K} \mathbf{F}\cdot \mathrm{d}\mathbf{S}$ gdje je $\mathbf{F} = \begin{pmatrix} x^2+y^2 \\ z \\ 1 \end{pmatrix}$ i ∂K rub kugle K radijusa 1 s centrom u točki $T(2,1,0)$, a koji je orijentiran vanjskom normalom.

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4. Izračunati

$$\int_{(1,\pi)}^{(2,3\pi)} 2x\sin y\,\mathrm{d}x + \left(x^2+1\right)\cos y\,\mathrm{d}y$$

20

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$f'''(t) - 4\,f'(t) = \cos(2t)\,,\quad f(0)=f'(0)=f''(0)=0.$$

Ø

IME I PREZIME:

IVAN KERO

BROJ INDEKSA:

56434 - 0269029457

⑤ $f'''(t) - 4f'(t) = \cos(2t)$ $\quad f(0)=0$

$f'(0) = f''(0) = 0$

$$= \left(s^3F(s) - s^2f(0) - sf'(0) - f''(0)\right) - 4\left(sF(s) - f(0)\right) = \frac{s}{s^2+2^2}$$

$$= \left(s^3F(s) - 0 - 0 - 0\right) - 4\left(sF(s) - 0\right) = \frac{s}{s^2+4}$$ ✓

$$s^3F(s) - 4sF(s) = \frac{s}{s^2+4}$$

$$F(s)\cdot(s^3-4s) = \frac{s}{s^2+4} \Big/ : (s^3-4s)$$

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

$$\frac{s}{s(s^2-4)\cdot(s^2+4)} = \frac{s}{s(s-2)(s+2)\cdot(s^2+4)} = \frac{A}{s} + \frac{B}{(s-2)} + \frac{C}{(s+2)} + \frac{Ds+E}{(s^2+4)}$$

$$\frac{s}{s(s-2)(s+2)(s^2+4)} = \frac{A\cdot(s^2-4)\cdot(s^2+4) + Bs(s+2)(s^2+4) + Cs(s-2)\cdot(s^2+4) + (Ds+E)\cdot s(s^2-4)}{s(s-2)(s+2)(s^2+4)}$$

$$s = A(s^4-16) + Bs(s^3+4s+2s^2+8) + Cs(s^3+4s-2s^2-8) + (Ds^4-4Ds^2+Es^3-4Es)$$

$$s = As^4 - 16A + Bs^4 + 4Bs^2 + 2Bs^3 + 8Bs + Cs^4 + 4Cs^2 - 2Cs^3 - 8Cs + (Ds^4 - 4Ds^2 + Es^3 - 4Es)$$

$$s = (As^4 + Bs^4 + Cs^4 + Ds^4) + (2Bs^3 - 2Cs^3 + Es^3) + (4Bs^2 + 4Cs^2 - 4Ds^2) + (8Bs - 8Cs - 4Es) - 16A$$

$= 0 = A+B+C+D$; $0 = 2B - 2C + E$; $0 = 4B + 4C - 4D$; $1 = 8B - 8C - 4E$

Ime i prezime: IVAN KERO   Broj indeksa:

$0 = -16A \Rightarrow A = 0$

$\emptyset$ VIDI MAZIĆ

?

RJEŠENJE?

(4) $\displaystyle\int_{(1,\pi)}^{(2,3\pi)} 2x\sin y\,dx + (x^2+1)\cos y\,dy$

$\begin{vmatrix} 2\sin y \\ -(x^2+1)\sin y \end{vmatrix}$

$f(-\sin y(x^2+1))$ ✓

$\sin 2\pi - \sin 2\pi = 0$

$2\sin 3\pi - 5\sin 3\pi$

$f(1,\pi) - f(2,3\pi) = 0 - 0 = 0$ ✓

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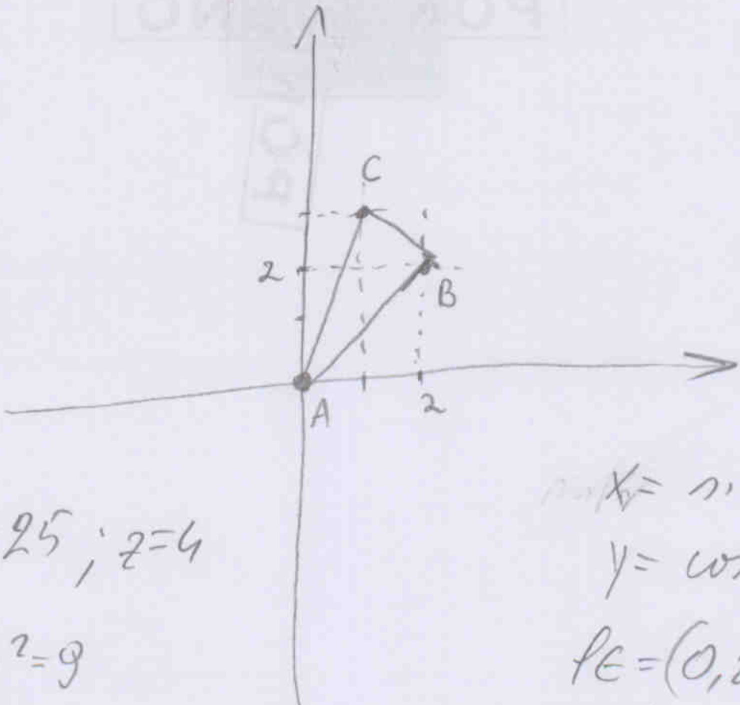
(1)

$|\ 2y$



$\emptyset$

(3) $x^2+y^2+z^2=25$; $z=4$

$x^2+y^2=9$

$r=3$

$x = \sin\varphi\, r\, dr$

$y = \cos\varphi\, r\, dr$

$\varphi \in (0,2\pi)$

$r \in (0,3)$

$z \in (0,4)$

$\emptyset$

Odmah popuniti ↓
IME I PREZIME: Marin Vulić **BROJ INDEKSA:**

OBAVEZNO POPUNITI VRIJEME RJEŠAVANJA ISPITA: DATUM OD DO .

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$$\int\limits_{(1,\pi)}^{(2,3\pi)} 2x\sin y\,\mathrm{d}x + \left(x^2+1\right)\cos y\,\mathrm{d}y$$ ∅

5. Koristeći Laplaceovu transformaciju riješiti diferencijalnu jednadžbu:

$$f'''(t) - 4\,f'(t) = \cos(2t)\,,\quad f(0)=f'(0)=f''(0)=0.$$ ∅

Ime i prezime: Marin Vulić **Broj indeksa:**

$$4.\ \int_{(1,\pi)}^{\overset{x\ \ y}{(2,3\pi)}} 2x\sin y\,dx + (x^2+1)\cos y\,dy$$

$$w = \begin{bmatrix} 2x\sin y \\ (x^2+1)\cos y \end{bmatrix} = -\operatorname{grad} f$$

$$\frac{df}{dx} = -2x\sin y \ /\int dx$$

$$f = \int -2x\sin y\,dx$$

$$f = 2\sin y \int x\,dx$$

$$f = -2\sin y\,\frac{x^2}{2} + C(y)$$

$$\frac{df}{dy} = -(x^2+1)\cos y$$

$$\frac{d\left(-2\sin y\frac{x^2}{2} + C(y)\right)}{dy} = -(x^2+1)\cos y \ \checkmark \ \Rightarrow$$

$$C(y) = -(x^2+1)\cos y \ /\int dy \ \times$$

$$C(y) = \int -(x^2+1)\cos y\,dy$$

$$C(y) = -(x^2+1)\int \cos y\,dy \ \ \emptyset$$

$$C(y) = -(x^2+1)\sin y$$

$$f = -2\frac{x^2}{2}\sin y - (x^2+1)\sin y \ \times$$

$$f = -2\,\frac{4}{2}\sin 3\pi - (1+1)\sin\pi$$

$$f = -4\sin 3\pi - 2\sin\pi$$

$$\frac{d(\sin y)}{dy}\ \downarrow$$

$$-\cancel{2}\cdot\frac{x^2}{\cancel{2}}\cdot(\cos y) + C'(y) = -(x^2+1)\cos y$$

$$C'(y) = -(x^2+1)\cos y + x^2\cos y$$

$$C'(y) = -\cos y \ /\int dy$$

$$C(y) = -\int \cos y\,dy = -\sin y + C$$

$$\Rightarrow\ f = -x^2\sin y - \sin y$$

$$f = -(x^2+1)\sin y$$

IME I PREZIME: Marin Vidić BROJ INDEKSA:

5. $f'''(t) - 4f'(t) = \cos(2t) \qquad f(0) = f'(0) = f''(0) = 0$

$f'''(t) = s^3F(s) - s^2 f(0) - s \cdot f'(0) - f''(0)$

$s^3 F(s)$

$f''(t) = s^2F(s) - sf(0) - f'(0)$

$= s^2 F(s)$

$s^3F(s) - 4s^2F(s) = \frac{s}{s^2+2}$

$F(s)(s^3 - 4s^2) = \frac{s}{s^2+2}$

$\frac{1}{8}\cdot\frac{1}{s} + \frac{0}{s^2} - \frac{17}{56}\cdot\frac{1}{s-4} + \frac{-\frac{3}{14} - \frac{10}{56}}{s^2+2}$

$\frac{1}{8} - \frac{17}{56}\cdot e^{4t} - \frac{22}{56}\cdot \cos(\sqrt{2}t)$

$\emptyset$

PREVIŠE GREŠAKA

VIDI MAŽIĆ

$\frac{\frac{s}{s^2+2}}{s^3-4s^2} = \frac{\frac{s}{s^2+2}}{s^2(s-4)} = \frac{s}{(s^2+2)s^2(s-4)} = \frac{s}{s^2(s-4)(s^2+2)} = \frac{A}{s} + \frac{B}{s^2} + \frac{C}{s-4} + \frac{D+Es}{s^2+2}$

$s = A(s(s-4)(s^2+2)) + B((s-4)(s^2+2)) + C(s^2(s^2+2)) + D(s^2(s-4)) + Es(s^2(s-4))$

$s = A(s(s^3-2s-4s^2-8)) + B(s^3-2s-4s^2-8) + C(s^4+2s^2) + D(s^3-4s^2) + Es(s^3-4s^2)$

$s = A(s^4-2s^2-4s^3-8s) + B(s^3-4s^2-2s-8) + C(s^4+2s^2) + D(s^3-4s^2) + Es^4 - 4Es^3$

$s = As^4 - 4As^3 - 2As^2 - 8As + Bs^3 - 4Bs^2 - 2Bs - 8B + Cs^4 + 2Cs^2 + Ds^3 - 4Ds^2 - Es^4 - 4Es^3$

$8A - 2B = 1$

$A + C - E = 0$

$-4A + B + D - 4E = 0$

$-2A - 4B + 2C - 4D = 0$

$-8B = 0$

$\boxed{B = 0}$

$8A = 1$

$\boxed{A = \frac{1}{8}}$

$C - E = -\frac{1}{8} \Rightarrow -E = -\frac{1}{8} - C \Rightarrow \boxed{E = \frac{1}{8} + C}$

$D - 4E = \frac{1}{2}$

$2C - 4D = \frac{1}{4}$

$-4E = \frac{1}{2} + \frac{3}{14}$

$-4E = \frac{7+3}{14}$

$-4E = \frac{10}{14}$

$-E = \frac{\frac{10}{14}}{4} = \frac{10}{56}$

$\boxed{E = -\frac{10}{56}}$

$D - 4(\frac{1}{8} + C) = \frac{1}{2}$

$D - \frac{1}{2} - 4C = \frac{1}{2}$

$D - 4C = 1$

$-4D + 2C = \frac{1}{4} / \cdot 2$

$D - \cancel{4C} = 1$

$-8D + \cancel{4C} = \frac{1}{2}$

$D - 8D = 1 + \frac{1}{2}$

$-7D = \frac{3}{2}$

$D = \frac{\frac{3}{2}}{\frac{7}{1}} = \frac{3}{14}$

$\boxed{D = -\frac{3}{14}}$

$C = E - \frac{1}{8}$

$C = -\frac{10}{56} - \frac{1}{8}$

$C = \frac{-10-7}{56} = \frac{-17}{56}$

$\boxed{C = -\frac{17}{56}}$

Ime i prezime: Marin Vulić   Broj indeksa:

3. $x^2+y^2+z^2=25$, $z=4$

$$\iiint x^2+y^2+z^2\,dx\,dy\,dz$$

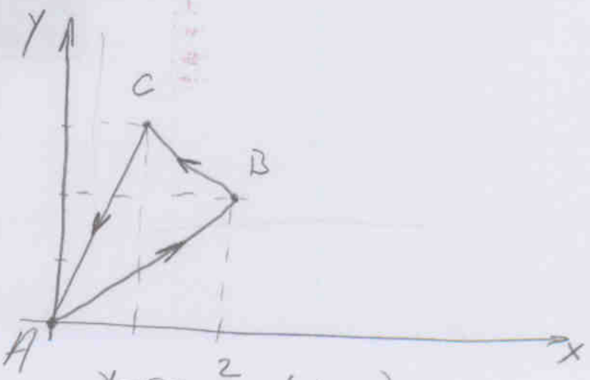
$x = r\cos\varphi$
$y = r\cos\varphi$
$z = z$

$$= -20\int_0^2 x^2dx + 70\int_0^2 x\,dx + 72\int_0^2 dx = -20\frac{x^3}{3}\Big|_0^2 + 70\frac{x^2}{2}\Big|_0^2 + 72x\Big|_0^2 =$$

$$= -20\cdot 2 + 140 + 144 = -40 + 140 + 144 = 244$$

1. $\oint_C \overset{P}{y^2}\,dx + \overset{Q}{(x+y)^2}\,dy = \iint_D \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y}\right)dxdy$ $A(\overset{x_1}{0},\overset{y_1}{0})$ $B(2,2)$ $C(\overset{x_1}{1},\overset{y_1}{3})$

$\left(\frac{dP(x,y)}{dx} + \frac{dQ(x,y)}{dy}\right)dxdy$ ×   VIDI BLITVIĆ



$$\frac{dP}{dx} = \frac{y^2}{dx} = 2y$$

$$\frac{dQ}{dy} = \frac{(x+y)^2}{dy} = \frac{x^2+2xy+y^2}{dy} = 2x+2y$$

$y-0 = \frac{2}{2}(x-0)$
$\overline{AB}\dots y = x$
$\overline{BC}\dots y-2 = \frac{1}{-1}(x-2)$
$y-2 = -x+2$
$\overline{BC}\dots y = -x+4$
$\overline{CA}\dots y-3 = \frac{-3}{-1}(x-1)$
$y-3 = -3x+3$
$\overline{CA}\dots y = -3x+6$

$$\iint_D Q(x,y)dx - P(x,y)dy = \iint_D 2y-2x+2y\,dxdy =$$

$$\int_0^2\int_x^{-3x+6} -2x+4y\,dxdy = \int_0^2 -2x\,dx + 4\frac{y^2}{2}\Big|_x^{-3x+6} =$$

$$= \int_0^2 -2x\,dx + 4\left(\frac{(-3x+6)^2}{2}\right) - 4\left(\frac{x^2}{2}\right) = \int_0^2 -2x\,dx + 4\left(\frac{-9x^2+36x+36}{2}\right) - 4\frac{x^2}{2} = \int_0^2 -2x\,dx + \left(\frac{-36x^2+144x+144}{2}\right) - 2x^2 =$$

$$= \int_0^2 -2x + (-18x^2+72x+72) - 2x^2dx = \int_0^2 -2x - 18x^2 + 72x + 72 - 2x^2\,dx = \int_0^2 -20x^2+70x+72\,dx =$$