MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xxi	POPUNJAVA NASTAVNIK
IME I PREZIME: Radovčić Rikardo BROJ INDEKSA:	Broj ↓ bodova

1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y'' + 3y' = 0$, uz $y(0) = 0$ i $y(3) = 0$. Na kraju provjeri rješenje. 15

2. Nađi koliko iznosi $f(2.5)$ ako f zadovoljava $dy = \left(1 + x + \frac{y}{1-x^2}\right) \mathrm{d}x$ i $y(0) = 0$. ~~15~~

3. Za funkciju $f(x, y) = \dfrac{x}{y}$ odrediti domenu, kodomenu, razinske krivulje i limes u ishodištu (ako postoji). ~~20~~ 13

4. $\displaystyle\int_0^{\pi/2} e^x \cos x \,\mathrm{d}x = ?$ 20

5. $\displaystyle\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \,\mathrm{d}x = ?$ ~~15~~

6. Integriranjem izračunati površinu trokuta zadanog točkama $A(0, 0)$, $B(-2, 2)$, $C(-1, -1)$. ~~15~~

Ukupno: 20

f	$\frac{\mathrm{d}f}{\mathrm{d}x}$
x^α $(\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x$ $(\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
α^x $(\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
$\cot x$	$\frac{-1}{\sin^2 x}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arctan x$	$\frac{1}{1+x^2}$

Tablica nekih integrala

$\int \mathrm{d}x = x + C$	$\int \frac{\mathrm{d}x}{a^2+x^2} = \frac{1}{a}\arctan\frac{x}{a} + C$	$\int \frac{\mathrm{d}x}{a^2-x^2} = \frac{1}{2a}\ln\left\lvert\frac{a+x}{a-x}\right\rvert + C$
$\int x^\alpha \mathrm{d}x = \frac{x^{\alpha+1}}{\alpha+1}$, $\alpha \neq -1$	$\int \tan x \,\mathrm{d}x = -\ln\lvert\cos x\rvert + C$	$\int \frac{\mathrm{d}x}{x^2-a^2} = \frac{1}{2a}\ln\left\lvert\frac{x-a}{x+a}\right\rvert + C$
$\int \frac{\mathrm{d}x}{x} = \ln\lvert x\rvert + C$	$\int \cot x \,\mathrm{d}x = \ln\lvert\sin x\rvert + C$	$\int \frac{\mathrm{d}x}{\sqrt{x^2\pm a^2}} = \ln\left\lvert x + \sqrt{x^2 \pm a^2}\right\rvert + C$
$\int e^x \mathrm{d}x = e^x + C$	$\int \frac{\mathrm{d}x}{\cos^2 x} = \tan x + C$	$\int \frac{\mathrm{d}x}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C$
$\int a^x \mathrm{d}x = \frac{a^x}{\ln a} + C$	$\int \frac{\mathrm{d}x}{\sin^2 x} = -\cot x + C$	$\int \frac{\mathrm{d}x}{\sqrt{2ax-x^2}} = \arccos\left(1 - \frac{x}{a}\right) + C$
$\int \sin x \,\mathrm{d}x = -\cos x + C$	$\int \sqrt{x^2 \pm a^2}\,\mathrm{d}x = \frac{1}{2}\left[x\sqrt{x^2\pm a^2} \pm a^2 \ln\left(x + \sqrt{x^2\pm a^2}\right)\right] + C$	
$\int \cos x \,\mathrm{d}x = \sin x + C$	$\int \sqrt{a^2 - x^2}\,\mathrm{d}x = \frac{1}{2}\left[x\sqrt{a^2-x^2} + a^2 \arcsin\left(\frac{x}{a}\right)\right] + C$	

5.

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \,dx = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{\sin x}{\cos x}\,dx => \int f(g(x)) \cdot g'(x)\,dx = \int f(u)\,du, \quad u = g(x)$$

$u = \cos x \quad du = -\sin x \quad dx = -\frac{1}{\sin x}\,du$

$$= \int_{\cos(-\frac{\pi}{2})}^{\cos\frac{\pi}{2}} \frac{\sin x}{u}\left(-\frac{1}{\sin x}\right)du = -\int_1^0 \frac{du}{u} = \int_0^1 \frac{du}{u}$$

$$= \left(\ln\lvert x\rvert\right)\Big|_0^1 = \ln 1$$

∅

④ $$\int_0^{\frac{\pi}{2}} e^x \cos x\,dx = \begin{cases} u = e^x & du = e^x \\ dv = \cos x & v = \sin x \end{cases}$$

$$= \left(e^x \cdot \sin x\right)\Big|_0^{\frac{\pi}{2}} - \int_0^{\frac{\pi}{2}} e^x \sin x\,dx = \begin{cases} u = e^x & du = e^x \\ dv = \sin x & v = -\cos x \end{cases}$$

$$= \left(e^x \cdot \sin x\right)\Big|_0^{\frac{\pi}{2}} - \left(\left(e^x \cdot (-\cos x)\right)\Big|_0^{\frac{\pi}{2}} - \int_0^{\frac{\pi}{2}} e^x \cdot (-\cos x)\,dx\right)$$

$$= \left(e^x \cdot \sin x\right)\Big|_0^{\frac{\pi}{2}} + \left(e^x \cdot \cos x\right)\Big|_0^{\frac{\pi}{2}} - \boxed{\int_0^{\frac{\pi}{2}} e^x \cdot \cos x\,dx}$$ --> ISTI KAO NA POČETKU

$$= \frac{e^x(\sin x + \cos x)}{2}\Big|_0^{\frac{\pi}{2}}$$

$$= \frac{e^{\frac{\pi}{2}}\left(\sin\frac{\pi}{2} + \cos\frac{\pi}{2}\right)}{2} - \frac{e^0(\sin 0 + \cos 0)}{2}$$

$$= \frac{e^{\frac{\pi}{2}}(1+0)}{2} - \frac{1(0+1)}{2} = \frac{e^{\frac{\pi}{2}}}{2} - \frac{1}{2}$$

20 ✓ $\frac{e^{\pi/2}}{2} - \frac{1}{2} \approx 1.9$

---

② Koliko iznosi $f(2,5)$ ako f zadovoljava: $dy = \left(1 + x + \frac{y}{1-x^2}\right)dx$ i $y(0) = 0$

$$dy = \left(1 + x + \frac{y}{1-x^2}\right)dx, \quad y(0) = 0$$

$$\frac{dy}{dx} = \left(1 + x + \frac{y}{1-x^2}\right)' \times$$

$$y'' = 0 + 1 + \left(\frac{y}{1-x^2}\right)' \times$$

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

$$y'' = 1 + \frac{y'(1-x^2) + y \cdot 2x}{1 - 2x^2 + x^4}$$

$$y'' = 1 + \frac{y'(1-x^2) + 2xy}{x^4 - 2x^2 + 1}$$

$$f(2,5) = f(x) = \frac{y'(1-2,5^2) + 2 \cdot 2,5y}{(2,5)^4 - 2 \cdot (2,5)^2 + 1}$$

$$= \frac{5,25y' + 5y}{-5,25}$$

0

③ Za funkciju $f(x,y)=\frac{x}{y}$ odrediti domenu, kodomenu, razinske krivulje i limes u ishodištu (ako postoji).

$f(x,y)=\frac{x}{y}$

$y\neq 0 \rightarrow D(f)=\mathbb{R}^2\setminus\{(x,0)\} \rightarrow$ domena

ili $D(f)=\{(x,y)\in\mathbb{R}^2 : y\neq 0\}$ ✓

3

$(x,y)\in D \xrightarrow{f} u=f(x,y)\in\mathbb{R} \rightarrow$ domena

$\underline{f(D)}=\{u \mid u=f(x,y),(x,y)\in D\}=\mathbb{R} \rightarrow$ kodomena ✓ 2

$\lim\limits_{(x,y)\to(0,0)} f(x,y)=\lim\limits_{(x,y)\to(0,0)}\frac{x}{y}=\lim\limits_{\substack{x,y\to 0\\ y=kx}}\frac{x}{kx}=\frac{1}{k}$ $\rightarrow$ ne postoji jer za različite k dobijemo različite vrijednosti limesa ✓ 7

↳ ukoliko $(x,y)\to(0,0)$ ide po putevima koje odgovaraju pravci $y=kx$

$\forall z_0\in f(D)$ $f(x,y)=z_0$

$x=0 \rightarrow z=0 \Rightarrow$ zraka 1

$z=1\rightarrow \frac{x}{y}=1 \Rightarrow$ razinska krivulja

MISLI STE SAMO DVIJE RAZINSKE KRIVULJE

MENE ZANIMA SKICA RAZINSKIH KRIVULJA, ODNOSNO VIZUALIZACIJA FUNKCIJE.

13

Rikardo Radovčić RR

17.06.2014.

⑥ Integriranjem izrač. površinu trokuta zadanog točkama A(0,0), B(-2,2), C(-1,-1).

$$P = \frac{1}{2}\left| x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2)\right|$$

$$P = \frac{1}{2}\left| 0\cdot(2+1) + (-2)(-1-0) + (-1)(0-2)\right|$$

$$P = \frac{1}{2}\left| 0+2+2\right| = \frac{1}{2}|4| = 2$$

~~0~~

POVRŠINU JE TREBALO ODREDITI INTEGRIRANJEM.

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xxi	POPUNJAVA NASTAVNIK Broj ↓ bodova
IME I PREZIME: Tibor Rak **BROJ INDEKSA:**	

1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y'' + 3y' = 0$, uz $y(0) = 0$ i $y(3) = 0$. Na kraju provjeri rješenje. 15

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4. $\displaystyle\int_0^{\pi/2} e^x \cos x \,\mathrm{d}x = ?$ 20

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Ukupno: 0

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$\ln x$	$\frac{1}{x}$
$\log_\alpha x\ (\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
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Tablica nekih integrala		
$\int \mathrm{d}x = x + C$	$\int \frac{\mathrm{d}x}{a^2+x^2} = \frac{1}{a}\arctan\frac{x}{a} + C$	$\int \frac{\mathrm{d}x}{a^2-x^2} = \frac{1}{2a}\ln\left\lvert\frac{a+x}{a-x}\right\rvert + C$
$\int x^\alpha \mathrm{d}x = \frac{x^{\alpha+1}}{\alpha+1},\ \alpha \neq -1$	$\int \tan x \,\mathrm{d}x = -\ln\lvert\cos x\rvert + C$	$\int \frac{\mathrm{d}x}{x^2-a^2} = \frac{1}{2a}\ln\left\lvert\frac{x-a}{x+a}\right\rvert + C$
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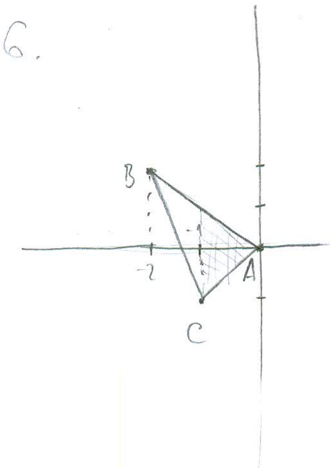
6.

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

$X - X_1 = \dfrac{Y_2 - Y_1}{X_2 - X_1} = Y - Y_1$



PRAVAC AB

$X - 0 \ \dfrac{2-0}{-2-0} \ Y + 2$

0

4. $\int_0^{\frac{\pi}{2}} e^x \cos x \, dx = \left(e^x(-\sin x)\right)\Big|_0^{\frac{\pi}{2}} = \left(e^{\frac{\pi}{2}}\left(-\sin\frac{\pi}{2}\right)\right) - \left(e^0(-\sin 0)\right)$

$= e^{\frac{\pi}{2}} - \sin\frac{\pi}{2} - 1 - 0 = e^{\frac{\pi}{2}} - \sin\frac{\pi}{2} - 1$

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IME I PREZIME: TONI PASTUOVIĆ **BROJ INDEKSA:**	

1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y'' + 3y' = 0$, uz $y(0) = 0$ i $y(3) = 0$. Na kraju provjeri rješenje. 15

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6. Integriranjem izračunati površinu trokuta zadanog točkama $A(0,0)$, $B(-2,2)$, $C(-1,-1)$. ~~15~~

Ukupno: $\emptyset$

f	$\frac{df}{dx}$
x^α $(\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x$ $(\alpha > 0)$	$\frac{1}{x \ln \alpha}$
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$\arctan x$	$\frac{1}{1+x^2}$

Tablica nekih integrala		
$\int dx = x + C$	$\int \frac{dx}{a^2+x^2} = \frac{1}{a} \arctan \frac{x}{a} + C$	$\int \frac{dx}{a^2-x^2} = \frac{1}{2a} \ln \left\lvert \frac{a+x}{a-x} \right\rvert + C$
$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1},\ \alpha \neq -1$	$\int \tan x \, dx = -\ln \lvert\cos x\rvert + C$	$\int \frac{dx}{x^2-a^2} = \frac{1}{2a} \ln \left\lvert \frac{x-a}{x+a} \right\rvert + C$
$\int \frac{dx}{x} = \ln \lvert x\rvert + C$	$\int \cot x \, dx = \ln \lvert\sin x\rvert + C$	$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln \left\lvert x + \sqrt{x^2 \pm a^2} \right\rvert + C$
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$\int \cos x \, dx = \sin x + C$	$\int \sqrt{a^2-x^2} \, dx = \frac{1}{2} \left[x\sqrt{a^2-x^2} + a^2 \arcsin \left(\frac{x}{a}\right)\right] + C$	

(3) $f(x,y) = \frac{x}{y}$ $\qquad \frac{x}{y} = C$

D_f $y \in \mathbb{R} \setminus \{0\}$ ✗ $\emptyset$

(1) $y'' + 3y' = 0$ $\quad y(0) = 0$, $y(3) = 0$ $\quad \emptyset$

$\ln|$

$1 - x^2 = t$

(2) $dy = \left(1 + x + \frac{y}{1-x^2}\right) dx \quad y(0) = 0$

$\int \frac{dy}{y} = \int 1 + x + \frac{1}{1-x^2}$ ✗

$\ln|y| = x + \frac{x^2}{2} + \ln|1-x^2| + \ln|C|$

$y = x + \frac{x^2}{2} + (1 - x^2 \cdot c) \Rightarrow 0 = 0 + \frac{0}{2} + (1 - 0 \cdot c) C = 0$

$y = x + \frac{x^2}{2} + (1 - x^2 \cdot c)$

$y = 2,5 + \frac{2,5^2}{2} + 1 = 6.625$

$f(2,5) = 6.625$

(4) $\int_0^{\frac{\pi}{2}} e^x \cos x \, dx = \left| \begin{matrix} u = \cos x \,\Big|' & dv = e^x dx \,\Big| \int \\ du = \sin x \, dx & v = e^x \end{matrix} \right| = \cos x \cdot e^x - \int e^x \cdot \sin x \, dx$

$u \cdot v - \int v \cdot du$

$= \cos x \cdot e^x - e^x$ ✗

(5) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \, dx = -\ln|\cos x| + c \Big|_{-\frac{\pi}{2}}^{\frac{\pi}{2}} = \lim_{\varepsilon \to 0} -\ln|\cos \varepsilon| - \lim_{\delta \to 0} \ln|\cos \delta|$ ✗

$= \ln|0| - \ln|0|$

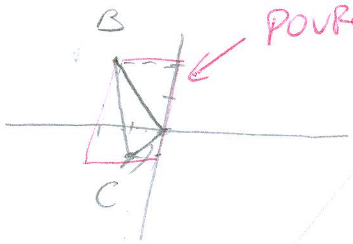
= nema realne površine koju zatvara tanges unutar granica

OVO JE NEPRAVI INTEGRAL KOJI DIVERGIRA

(6) $A(0,0)$

$B(-2,2)$

$C(-1,-1)$



POVRŠINA PRAVOKUTNIKA JE P=6

$AB \Rightarrow y = -x \quad f(x) - x$

$BC \Rightarrow \quad f(x) = -4x - 6 \qquad y = -x$

$CA \Rightarrow y = x \quad f(x) = x \qquad y = x$

BC CB

$(y - y_1) \cdot (x_2 - x_1) = (x - x_1)(y_2 - y_1)$

$y = -4x - 6$

$P = \int(BA - AC) - \int(BC - AC)$

$P_1 = \int BA - AC$

$P_2 = \int BC - AC$

TROKUT JE MANJI!!!

$P = 12,576$

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POPUNJAVA NASTAVNIK

IME I PREZIME: ANTE STANIŠIĆ

BROJ INDEKSA: 17-1-0066-2011

	Broj ↓ bodova
1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y''+3y'=0$, uz $y(0)=0$ i $y(3)=0$. Na kraju provjeri rješenje.	15
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4. $\displaystyle\int_0^{\pi/2} e^x\cos x\,\mathrm{d}x=?$	~~20~~
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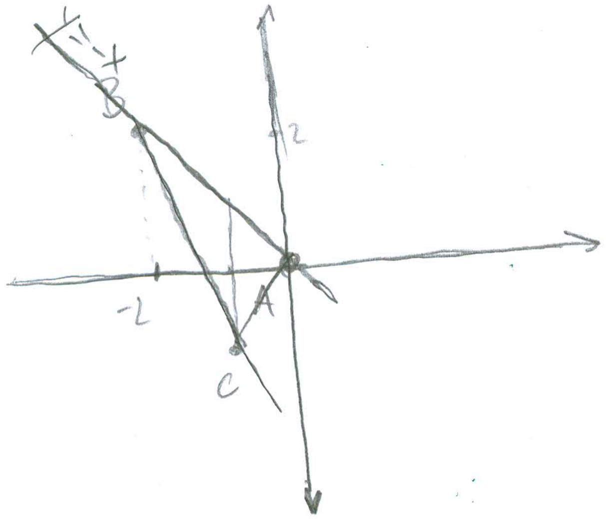
$\int \frac{\mathrm{d}x}{x} = \ln\lvert x\rvert + C$	$\int \cot x\,\mathrm{d}x = \ln\lvert\sin x\rvert + C$	$\int \frac{\mathrm{d}x}{\sqrt{x^2\pm a^2}} = \ln\left\lvert x+\sqrt{x^2\pm a^2}\right\rvert + C$
$\int e^x\,\mathrm{d}x = e^x + C$	$\int \frac{\mathrm{d}x}{\cos^2 x} = \tan x + C$	$\int \frac{\mathrm{d}x}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C$
$\int a^x\,\mathrm{d}x = \frac{a^x}{\ln a} + C$	$\int \frac{\mathrm{d}x}{\sin^2 x} = -\cot x + C$	$\int \frac{\mathrm{d}x}{\sqrt{2ax-x^2}} = \arccos\left(1-\frac{x}{a}\right) + C$
$\int \sin x\,\mathrm{d}x = -\cos x + C$	$\int \sqrt{x^2\pm a^2}\,\mathrm{d}x = \frac{1}{2}\left[x\sqrt{x^2\pm a^2}\pm a^2\ln\left(x+\sqrt{x^2\pm a^2}\right)\right] + C$	
$\int \cos x\,\mathrm{d}x = \sin x + C$	$\int \sqrt{a^2-x^2}\,\mathrm{d}x = \frac{1}{2}\left[x\sqrt{a^2-x^2}+a^2\arcsin\left(\frac{x}{a}\right)\right] + C$	

ANTE STANIŠIĆ

A(0,0) B(-2,2) C(-1,-1)



B(-2,2) C(-1,-1)

x_1 y_1 x_2 y_2

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

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

$$y-2=-3x-6$$

$$y=-3x+2-6$$

$$\boxed{y=-3x-4}\ BC$$

A(0,0) C(-1,-1)

x_1 y_1 x_2 y_2

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

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

$$\boxed{y=1x}\ AC$$

B(-2,2) A(0,0)

x_1 y_1 x_2 y_2

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

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

$$\cancel{y=2+(-1x)-2}$$

$$\boxed{y=-1x}\ BA$$

$$P_1=\int_{-2}^{-1}((-x)-(-3x-4))dx=\int_{-2}^{-1}(-x+3x+4)dx=\int_{-2}^{-1}(2x+4)dx$$

$$P_1=2\cdot\frac{x^2}{2}+4x\Big|_{-2}^{-1}=\left(2\cdot\frac{(-1)^2}{2}+4\cdot(-1)\right)-\left(2\cdot\frac{(+2)^2}{2}+4\cdot(-2)\right)=-3+4=1$$

$$P_2=\int_{-1}^{0}((-x)-(1x))dx=\int_{-1}^{0}(\cancel{-x}+\cancel{x})dx=P_2=0$$

KAKO TA POVRŠINA MOŽE BITI NULA ?

$$\boxed{P=P_1+P_2=1}$$

$P=1$

0

) $D_f = \mathbb{R}$ X

5) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \, dx = 0$

K	0	1	2
x_K	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$
f_K	-0,0274	0	0,0274

$$\frac{\frac{\pi}{2}}{6}(-0{,}0274 + 0{,}274) = 0$$ X

ANTE STANISIO 14-1-0066-2011

4)

$$\int_0^{\frac{\pi}{2}} e^x \cos x\,dx \quad \Bigg| \quad \begin{matrix} u = e^x & dv = \cos x\,dx \\ du = e^x\,dx & v = \int \cos x\,dx = \sin x \end{matrix}$$

$$I = \sin x\, e^x - \int \sin x\, e^x\,dx$$

$$= \sin x\, e^x + \cos x - e^x \quad \times \qquad \emptyset$$

$$= \sin\frac{\pi}{2}\, e^{\frac{\pi}{2}} + \cos\frac{\pi}{2} - e^{\frac{\pi}{2}}$$

$$= -3{,}67898$$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xxi	POPUNJAVA NASTAVNIK Broj ↓ bodova
IME I PREZIME: MAĆE ĆOSIĆ **BROJ INDEKSA:** 55924	

1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y'' + 3y' = 0$, uz $y(0) = 0$ i $y(3) = 0$. Na kraju provjeri rješenje. 15

2. Nađi koliko iznosi $f(2.5)$ ako f zadovoljava $dy = \left(1 + x + \frac{y}{1-x^2}\right) dx$ i $y(0) = 0$. 15

3. Za funkciju $f(x, y) = \dfrac{x}{y}$ odrediti domenu, kodomenu, razinske krivulje i limes u ishodištu (ako postoji). ~~20~~

4. $\displaystyle\int_0^{\pi/2} e^x \cos x \, dx = ?$ ~~20~~

5. $\displaystyle\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \, dx = ?$ ~~15~~

6. Integriranjem izračunati površinu trokuta zadanog točkama $A(0, 0)$, $B(-2, 2)$, $C(-1, -1)$. ~~15~~

Ukupno: $\cancel{0}$

f	$\frac{df}{dx}$
x^α $(\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x$ $(\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
α^x $(\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
$\cot x$	$\frac{-1}{\sin^2 x}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arctan x$	$\frac{1}{1+x^2}$

Tablica nekih integrala		
$\int dx = x + C$	$\int \frac{dx}{a^2+x^2} = \frac{1}{a}\arctan\frac{x}{a} + C$	$\int \frac{dx}{a^2-x^2} = \frac{1}{2a}\ln\left\|\frac{a+x}{a-x}\right\| + C$
$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1}$, $\alpha \neq -1$	$\int \tan x \, dx = -\ln\|\cos x\| + C$	$\int \frac{dx}{x^2-a^2} = \frac{1}{2a}\ln\left\|\frac{x-a}{x+a}\right\| + C$
$\int \frac{dx}{x} = \ln\|x\| + C$	$\int \cot x \, dx = \ln\|\sin x\| + C$	$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln\left\|x + \sqrt{x^2 \pm a^2}\right\| + C$
$\int e^x dx = e^x + C$	$\int \frac{dx}{\cos^2 x} = \tan x + C$	$\int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C$
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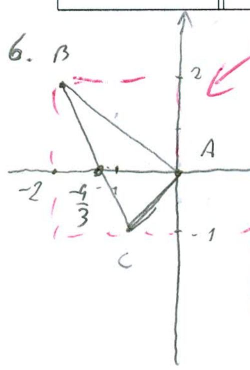
$\int \cos x \, dx = \sin x + C$	$\int \sqrt{a^2-x^2}\, dx = \frac{1}{2}\left[x\sqrt{a^2-x^2} + a^2 \arcsin\left(\frac{x}{a}\right)\right] + C$	

6.



POVRŠINA PRAVOKUTNIKA JE P=6

TROKUT MORA BITI MANJI

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

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

$\boxed{y = -x}$

$AC: \; y - 0 = \frac{-1-0}{-1-0}(x-0)$

$\boxed{y = x}$

$BC: \; y - 2 = \frac{-1-2}{-1+2}(x+2)$

$y - 2 = -3x - 6$

$\boxed{y = -3x - 4}$

$-3x - 4 = 0$

$-3x = 4$

$\boxed{x = -\frac{4}{3}}$

$$P = \int_{-2}^{0} -x\,dx - \int_{-2}^{-\frac{4}{3}} -3x-4\,dx - \int_{-1}^{0} x\,dx - \int_{-\frac{4}{3}}^{-1} -3x-4\,dx = -\frac{x^2}{2}\Big|_{-2}^{0} - \frac{3x^2}{2} - 4x\Big|_{-2}^{-\frac{4}{3}} - \frac{x^2}{2}\Big|_{-\frac{4}{3}}^{-1} - \left(-\frac{3x^2}{2} - 4x\right)\Big|_{-\frac{4}{3}}^{-1} =$$

$$= -\left(-\left(\frac{-2^2}{2}\right)\right) - \left(\frac{3\cdot\left(-\frac{4}{3}\right)^2}{2} - 4\cdot\left(-\frac{4}{3}\right) - \left(-\left(\frac{3\cdot(-2)^2}{2} - 4(-2)\right)\right)\right) - \left(\frac{-1^2}{2} - \left(\frac{-\frac{4}{3}^2}{2}\right)\right) - \left(-\frac{3(-1)^2}{2} - 4\cdot(-1) - \left(-\left(-\left(\frac{3\cdot\frac{4}{3}^2}{2} - 4\cdot\left(-\frac{4}{3}\right)\right)\right)\right)\right)$$

$$= 2 + 6 - \frac{1}{2} + \frac{11}{2} = \underline{\underline{13}}$$ ×

$\cancel{0}$

5) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \, dx = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{\sin x}{\cos x} dx = \left| \begin{array}{l} \cos x = t \\ -\sin x \, dx = dt /(-1) \\ \sin x \, dx = -dt \end{array} \right| = -\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{dt}{t}$

$= -\ln|t| \Big|_{-\frac{\pi}{2}}^{\frac{\pi}{2}} = -\ln(\cos x) \Big|_{-\frac{\pi}{2}}^{\frac{\pi}{2}}$

$= -\left(\ln(\cos\frac{\pi}{2}) - (-\ln \cos\frac{\pi}{2})\right) =$

$= -\left(\ln(1) - (-\ln(1))\right) = 0$ ✗ $\cancel{0}$

4) $\int_0^{\frac{\pi}{2}} e^x \cos x \, dx = \left| \begin{array}{ll} e^x = u' & \cos x \, dx = dv \\ e^x = du & \sin x = v \end{array} \right|$

$e^x \cdot \sin x - \int_0^{\frac{\pi}{2}} \sin x \, e^x =$

✗ $\cancel{0}$

3) $f(x,y) = \frac{x}{y}$

Domena

$y \neq 0$

$D = \mathbb{R} \setminus (0)$ ✗

$D = \mathbb{R} \times (\mathbb{R} \setminus \{0\})$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xxi	POPUNJAVA NASTAVNIK Broj ↓ bodova
IME I PREZIME: RINO KURTIN BROJ INDEKSA:	

1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y'' + 3y' = 0$, uz $y(0) = 0$ i $y(3) = 0$. Na kraju provjeri rješenje. 15

2. Nađi koliko iznosi $f(2.5)$ ako f zadovoljava $dy = \left(1 + x + \frac{y}{1-x^2}\right) \mathrm{d}x$ i $y(0) = 0$. 15

3. Za funkciju $f(x, y) = \dfrac{x}{y}$ odrediti domenu, kodomenu, razinske krivulje i limes u ishodištu (ako postoji). 20

4. $\displaystyle\int_0^{\pi/2} e^x \cos x \,\mathrm{d}x = ?$ 20

5. $\displaystyle\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \tan x \,\mathrm{d}x = ?$ 15

6. Integriranjem izračunati površinu trokuta zadanog točkama $A(0, 0)$, $B(-2, 2)$, $C(-1, -1)$. 15

Ukupno: $\emptyset$

f	$\frac{\mathrm{d}f}{\mathrm{d}x}$
$x^\alpha\ (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
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4. $\displaystyle\int_0^{\pi/2} e^x \cos x \,dx =$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!**

xxi

IME I PREZIME: Ivan Klanac **BROJ INDEKSA:** 0098-2011

POPUNJAVA NASTAVNIK

Broj ↓ bodova

1. Odredi partikularno rješenje koje zadovoljava navedenu ODJ i uvjete: $y'' + 3y' = 0$, uz $y(0) = 0$ i $y(3) = 0$. Na kraju provjeri rješenje. 15

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1

(2) $f(2.5)$

$$dy = \left(1 + x + \frac{y}{1-x^2}\right) dx$$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xxi

IME I PREZIME: TONI UGLEŠIĆ **BROJ INDEKSA:** 17-1-0065-2011

POPUNJAVA NASTAVNIK
Broj ↓ bodova

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