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

IME I PREZIME: IVAN DONAT GRŽAN **BROJ INDEKSA:** 57648-2009

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
2. Odrediti lokalne ekstreme funkcije $f(x,y) = \sin(x) \cdot \cos(y)$ na kvadratu $x \in [0, 2\pi]$, $y \in [0, 2\pi]$. 15
3. Pronaći ravninu koja dira graf funkcije $f(x,y) = xy - \ln(xy)$ povučenu u točki $(4, 1, z_0)$ tog grafa. 15
4. $\int\limits_0^2 x \sin x^2 \, dx = ?$ 20
5. $\int_0^1 \frac{2x}{x^2 - x - 2} = ?$ ~~15~~
6. Izračunati površinu područja omeđenog krivuljama $x + y^2 = 6$ i $x + y = 0$. 20

Ukupno: 20

f	$\frac{df}{dx}$
$x^\alpha \; (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x \; (\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
$\alpha^x \; (\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
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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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$\int \sin x \, dx = -\cos x + C$	$\int \sqrt{x^2 \pm a^2}\, dx = \frac{1}{2}\left[x\sqrt{x^2 \pm a^2} \pm a^2 \ln\left(x + \sqrt{x^2 \pm a^2}\right)\right] + C$	
$\int \cos x \, dx = \sin x + C$	$\int \sqrt{a^2 - x^2}\, dx = \frac{1}{2}\left[x\sqrt{a^2-x^2} + a^2 \arcsin\left(\frac{x}{a}\right)\right] + C$	

4. $\int\limits_0^2 x \sin x^2 dx =$ $\left| \begin{array}{l} x^2 = u \\ 2x\,dx = du \end{array}\right.$ $x\,dx = \frac{1}{2} du$

$$\int\limits_0^2 \sin(x^2)\, x\,dx = \int\limits_0^2 \sin(u)\, \frac{1}{2} du = \frac{1}{2}\int\limits_0^2 \sin(u)\,du =$$

$$= -\frac{1}{2}\cos(u)\Big|_0^2 = -\frac{1}{2}\cos(x^2)\Big|_0^2 =$$

$$= -\frac{1}{2}\cos(4) + \frac{1}{2}\cos(0)$$

$$= 0{,}8268$$ ✓

IVAN DONAT GRZAN

$$\left| 2\sin x = du \right.$$

(5.) $$\int_0^1 \frac{2x}{x^2-x-2} =$$

$$= \left| d(x^2-x-2) = (2x-1)\,dx \right|$$

$$= \int_0^1 \frac{2x-1+1}{x^2-x+2}\,dx$$

$$= \int_0^1 \frac{2x-1}{x^2-x}\,dx + \int_0^1 \frac{dx}{x^2-x-2}$$

?

$$= \frac{1}{x^2-x-2} = \frac{1}{(x+1)(x-2)} = \frac{A}{x+1} + \frac{B}{x-2}$$

$$= \frac{A(x-2)+B(x+1)}{(x+1)(x-2)} = \frac{Ax-2A+Bx+B}{(x+1)(x-2)}$$

$x_1 = 0$

$y_1 = 0$

$1 = -2A + B$

$1 = -Ax + Bx$

$B = 1 + 2A$

$Ax = 1 - Bx$

?

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

IME I PREZIME: MARIN BABAJKO

BROJ INDEKSA:

POPUNJAVA NASTAVNIK
Broj ↓ bodova

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Ukupno: 55

f	$\frac{df}{dx}$
$x^\alpha\ (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x\ (\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
$\alpha^x\ (\alpha > 0)$	$\alpha^x \ln \alpha$
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Tablica nekih integrala

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$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1},\ \alpha \neq -1$	$\int \tan x\, dx = -\ln\|\cos x\| + C$	$\int \frac{dx}{x^2-a^2} = \frac{1}{2a}\ln\left\|\frac{x-a}{x+a}\right\| + C$
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6. $x + y^2 = 6$

$x + y = 0$

ZA POVRŠINU NIJE BITNO ~~kako~~ i SU OZNAKE

$\boxed{\begin{array}{l} y + x^2 = 6 \\ y + x = 0 \end{array}}$

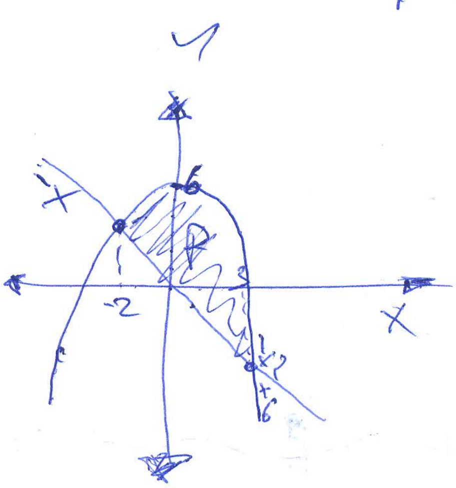
$y = -x^2 + 6$

$y = -x$

$\Rightarrow -x^2 + 6 = -x$

$x^2 - x - 6 = 0$

$x_{12} = \frac{1 \pm \sqrt{1+24}}{2} \Rightarrow x_1 = 3, \ x_2 = -2$



$P = \int_{-2}^{3} -x^2 + 6 - (-x) = \left\{-\frac{x^3}{3} + \frac{x^2}{2} + 6x\right\}_{-2}^{3} =$

$= -\frac{27}{3} + \frac{9}{2} + 18 - \left(-\frac{-8}{3} + \frac{4}{2} - 12\right) =$

$= -9 + \frac{9}{2} + 18 - \frac{8}{3} - 2 + 12 = \frac{114}{6} + \frac{27}{6} - \frac{16}{6} = \boxed{\frac{125}{6}} = P$

4. $\int_0^2 x \cdot \sin(x^2)\,dx$

$t = x^2$

$dt = 2x\,dx \quad / : 2$

$\frac{dt}{2} = x\,dx$

$\frac{1}{2}\int_0^2 \sin(t)\,dt =$

$= \frac{1}{2}\left[-\cos(x^2)\right]_0^2 = \frac{1}{2}\cdot\left(-\cos(4) + \cos(0)\right) =$

$= \frac{1}{2}(0.654 + 1) = \underline{0.827}$

5. $\boxed{\int_0^1 \frac{2x}{x^2 - x - 2}}$

$x_{12} = \frac{1 \pm \sqrt{1+8}}{2} \Rightarrow$

$x_1 = 2, \; x_2 = -1$

$\int_0^1 \frac{2x}{(x-2)(x+1)} = \int_0^1 \frac{A}{(x-2)} + \frac{B}{(x+1)} = \int_0^1 \frac{Ax + A + Bx - 2B}{(x-2)(x+1)}$

$2 = A + B \quad / \cdot 2$

$0 = A - 2B$

$4 = 2A + 2B$

$0 = A - 2B \quad / +$

$4 = 3A \Rightarrow A = \frac{4}{3}$

$B = \frac{4}{6}$

$\int_0^1 \frac{2x}{x^2-x-2} = \left[\frac{4}{3}\ln|x-2| + \frac{4}{6}\ln|x+1|\right]_0^1 =$

$\boxed{= \frac{4}{3}\ln|-1| + \frac{4}{6}\ln|2| - \left(\frac{4}{3}\ln|-2| + \frac{4}{6}\ln|1|\right)}$ =

=

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

IME I PREZIME: BRANIMIR PIJACA **BROJ INDEKSA:**

POPUNJAVA NASTAVNIK

Broj ↓ bodova

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Ukupno: $\emptyset$

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$$\int_0^2 x \sin x^2 \, dx \quad \left[\begin{array}{l} x^2 = t \\ 2x\,dx = dt \\ x\,dx = \frac{1}{2}\,dt \end{array} \right. \quad \begin{array}{l} x_1 = 0 \\ x_2 = 4 \end{array}$$

$$= \int_0^4 \sin t \frac{1}{2} \, dt$$

$$= \frac{1}{2} \int_0^4 \sin t \, dt$$

$$= \frac{1}{2} (-\cos t) \Big|_0^4$$

$$= -\frac{1}{2} \cos(x^2) \Big|_0^4 = -\frac{1}{2} \cos(4)^2 - \left(-\frac{1}{2} \cos(0)^2\right)$$

UVRSTILI STE U STUPNJEVIMA !!!

$$= -0{,}49 - \left(-\frac{1}{2}\right)$$

$$= 0{,}01 \quad \emptyset$$

$$\int_0^1 \frac{2x}{x^2-x-2}$$

$x^2-x-2=0$ $\quad x_1=\frac{4}{2}=2 \quad x_2=\frac{-2}{2}=-1$

$x_{12}=\frac{1\pm\sqrt{1+8}}{2}$

Nepravi integral

$$\int_0^1 \frac{dt}{t}$$

$x_{12}=\frac{1\pm 3}{2}$

$x^2-x-2=t$ $\quad$ ~~$3x\,dx = 1\,dt$~~

$2x-1\,dx=dt$

$2x\,dx=dt$

$$\int_0^1 \ln|t|$$

$$\int_0^1 \ln|x^2-x-2| \qquad \lim_{x\to} \int_0^1 \ln|x^2-x-2|$$

~~$x=-y^2+6$~~

$y^2=-x+6$

a) $x+y^2=6$ $\qquad x+y=0$

$-y+y^2-6=0$ $\qquad x=-y$

$y^2-y-6=0$

x	1	2	0	-1	-2.5
y	-1	-2	0	1	2?

x	0	1	2	-1
y	2,44	2,23	2	2,64

$y_{12}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $\qquad y_1=\frac{6}{2}=3$

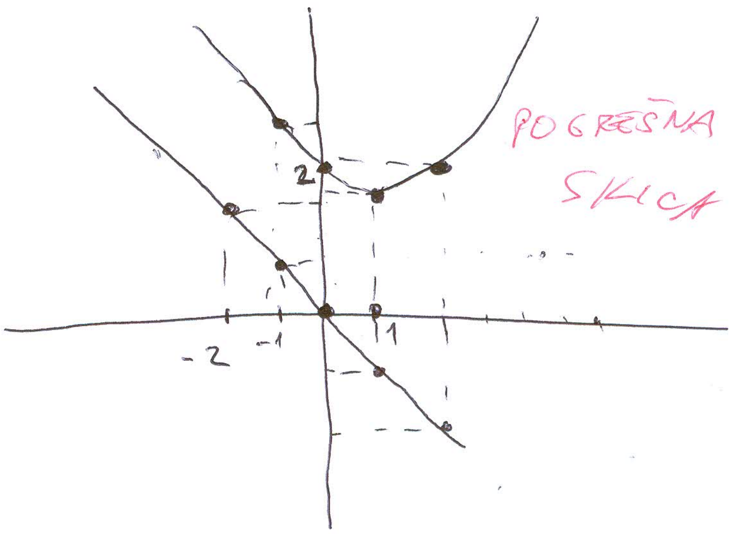
$y_2=\frac{-4}{2}=-2$

$y_{12}=\frac{1\pm\sqrt{1+24}}{2}$

$y_{12}=\frac{1\pm 5}{2}$

$$\int_{-2}^{3}$$

$P=0$



POGREŠNA SKICA

$x=-y^2+6$

$y=2,6$

$f(xy) = xy - \ln(xy)$ $\quad T(4,1,z_0)$

$T(4,1,2{,}6)$

$z_0 = 4 \cdot 1 - \ln(4 \cdot 1)$

$= 4 - 1{,}386$

$= 2{,}6$

$f(x)T = y - \frac{1}{y} y \qquad f_y(T) = x - \frac{1}{x}$

$f(x)T = 1 - \frac{1}{1}$

$f_x T = 0$

$f(x)T = y - \frac{1}{y} \cdot y \qquad f_y(T) = x - \frac{1}{x} \cdot x$

$= 1 - \frac{1}{1} \cdot 1 \qquad = 4 - \frac{1}{4} \cdot 4$

$= 0 \qquad = 3$

$z - z_0 = f_x T(x - x_1) + f_y T(y - y_1)$

$z - 2{,}6 = 0(x - 4) + 3(y - 1)$

$z - 2{,}6 = 0 + 3y \cancel{+3} - 3$

$z = +3y - 3 + 2{,}6$

Branimir Pijaca

$$\cancel{\int_0 \frac{2x}{x^2-x-2}}$$

$f(xy) = \sin(x) \cdot \cos(y)$

$df_x = \cos x$ $\qquad$ $df_y = -\sin(y)$

$df_{xx} = -\sin x$ $\qquad$ $df_y = -\cos(y)$

$\cos x = 0$ $\qquad$ $-\sin(y) = 0$

$x = \frac{\pi}{4}$ $\qquad$ $y = 0$

$T(\frac{\pi}{4}, 0)$

$A = -\sin x$

$A = 0 \Rightarrow$ Nema ekstrema

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3.) $f(x,y) = xy - \ln(xy)$

$(\overset{x}{4}, \overset{y}{1}, z_0)$

$z_0 = 4\cdot 1 - \ln(4\cdot 1)$
$= 2.61$

$\frac{\partial f}{\partial x} = y - \frac{1}{xy}\cdot y$

$\partial_x f(x_0, y_0) = 1 - \frac{1}{4\cdot 1}\cdot 1 = \frac{3}{4}$

$\frac{\partial f}{\partial y} = -\frac{1}{xy}$ ×

$\partial_y f(x_0, y_0) = -\frac{1}{4\cdot 1} = -\frac{1}{4}$

$f(x_0, y_0) = 4\cdot 1 - \ln(4\cdot 1)$
$= 2.61$

$$\partial_x f(x_0, y_0) \cdot (x - x_0) + \partial_y f(x_0, y_0) \cdot (y - y_1) + (-1) \cdot (z - f(x_0, y_0)) = 0$$

$$\frac{3}{4} \cdot (x - 4) - \frac{1}{4} \cdot (y - 1) + (-1) \cdot (z - 2{,}61) = 0$$

$$\frac{3}{4} x - 3 - \frac{1}{4} y + \frac{1}{4} - z + 2{,}61 = 0$$

$$\frac{3}{4} x - \frac{1}{4} y - z - 0{,}39 = 0$$

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IME I PREZIME: ANTE PAVLOVIĆ **BROJ INDEKSA:** 54959/2007	

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
2. Odrediti lokalne ekstreme funkcije $f(x, y) = \sin(x) \cdot \cos(y)$ na kvadratu $x \in [0, 2\pi]$, $y \in [0, 2\pi]$. 15
3. Pronaći ravninu koja dira graf funkcije $f(x, y) = xy - \ln(xy)$ povučenu u točki $(4, 1, z_0)$ tog grafa. 15
4. $\int_0^2 x \sin x^2 \, dx = ?$ 20
5. $\int_0^1 \frac{2x}{x^2 - x - 2} = ?$ 15
6. Izračunati površinu područja omeđenog krivuljama $x + y^2 = 6$ i $x + y = 0$. 20

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

(4) $\int_0^2 x \sin x^2 \, dx$

$u = x$
$du = dx$
$dv = \sin x^2 dx$
$v = \int \sin x^2 dx$
$v = -\cos x^2$

$x \cdot (-\cos x^2) - \int -\cos x^2 \, dx$ ✗

$-\cos x^2 x + \sin x^2 + C \Big|_0^2$

$(-\cos 2^2 \cdot 2 + \sin 2^2) - (-\cos 0^2 \cdot 0 + \sin 0^2)$

(5) $\int_0^1 \frac{2x}{x^2-x-2} = \cancel{\frac{A}{x^2} + \frac{B}{x} + \frac{C}{2}} \quad \cancel{(x^2-x-2)} \quad \cancel{x=0} \quad \cancel{x=1}$

$\cancel{= 2x = A(-x-2) + B(x^2-2) + C(x^2-x)}$

$\cancel{0 = -2A - 2B \qquad 2A = -2B}$

$\cancel{2 = -3A + 1B}$

$\cancel{3A = 1B - 2}$

$x^2 - x - 2 = t$

$2x = dt$

$\int_0^1 \frac{dt}{t} = \ln|t| + C = \Big[\ln|x^2-x-2|\Big]_0^1 + C$

$= \ln|1-1-2| - \ln|-2| = \ln|-4| \ldots - \ln|-2| = \ln|4| - \ln|2|$

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

Ime i prezime: MIHOVIL PEDIŠIĆ **Broj indeksa:** 17-2-0253-2012

Popunjava nastavnik | Broj ↓ bodova

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
2. Odrediti lokalne ekstreme funkcije $f(x,y) = \sin(x) \cdot \cos(y)$ na kvadratu $x \in [0, 2\pi]$, $y \in [0, 2\pi]$. 15
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IZBAČEN ZBOG ŠALABAHTERA

Ukupno:

f	$\frac{df}{dx}$
$x^\alpha \ (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x \ (\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
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$\tan x$	$\frac{1}{\cos^2 x}$
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$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
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Tablica nekih integrala

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

4. $\int_0^2 x \sin x^2 dx = \left\{ \begin{matrix} t = x^2 \\ dt = 2x dx \end{matrix} \right\} = \int_0^2 2 \sin t \, dt = 2 \int_0^2 \sin t \, dt = -2 \cdot \cos t \Big|_0^2 =$

$= -2 \cdot \cos x^2 \Big|_0^2 = (-2 \cdot \cos 2^2) - (-2 \cdot \cos 0) = -2 - (-2) = 0$

5. $\int_0^1 \frac{2x}{x^2-x-2} dx = \int_0^1 \frac{2x+1-1}{x^2-x-2} dx = \left\{ \begin{matrix} x^2-x-2 = t \\ dt = 2x-1 \, dx \end{matrix} \right\} = \int_0^1 \frac{2x-1}{x^2-x-2} dx + \int \frac{dx}{x^2-x-2} =$

$= \int_0^1 \frac{dt}{t} + \int_0^1 \frac{dx}{x^2-x+1-3} = \ln|x^2-x-2| + \int \frac{dx}{(x-1)^2 - \sqrt{3}^2} = \left\{ \begin{matrix} x-1 = t \\ dt = dx \end{matrix} \right\} =$

$= \ln|x^2-x-2| + \int \frac{dt}{t^2 - (\sqrt{3})^2} = \ln|x^2-x-2| + \frac{1}{2\sqrt{3}} \ln \left| \frac{x-\sqrt{3}}{x+\sqrt{3}} \right| \Big|_0^1 =$

$\left(\ln|1-1-2| + \frac{1}{2\sqrt{3}} \ln \left| \frac{1-\sqrt{3}}{1+\sqrt{3}} \right| \right) - \left(\ln|-2| + \frac{1}{2\sqrt{3}} \ln \left| \frac{-\sqrt{3}}{\sqrt{3}} \right| \right) =$

$= 0{,}312944182 - 0{,}69314718 = -0{,}380172998$

2. $f(x,y) = \sin x \cdot \cos y \qquad x \in [0, 2\pi] \qquad y \in [0, 2\pi]$

$$\frac{\delta f}{\delta x} = \cos x$$

$$\frac{\delta f}{\delta y} = -\sin y$$

3. $f(x,y) = xy - \ln(xy) \qquad T(4, 1, z_0)$

$$f_x = \frac{\delta f}{\delta x} = y - \frac{1}{x} = 1 - \frac{1}{4} = \frac{3}{4}$$

$$f_{x(T)} = \frac{3}{4}$$

$$f_y = x - \frac{1}{y} = 4 - 1 = 3$$

$$f_{y(T)} = 3$$

$$z_0 = xy - \ln(xy)$$

$$z_0 = 4 - \ln 4$$

$$z_0 = 2{,}613705639$$

$$z - z_0 = \left(f_{x(T)}(x - x_0) + f_{y(T)}(y - y_0)\right)$$

$$z - (4 - \ln 4) = \left(\frac{3}{4}(x-4) + 3(y-1)\right)$$

$$z - 4 + \ln 4 = \frac{3}{4}x - 3 + 3y - 3$$

$$z = \frac{3}{4}x + 3y - 6 + 4 - \ln 4$$

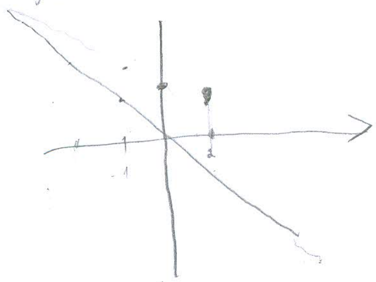
$$z = \frac{3}{4}x + 3y - 2 - \ln 4$$

MIHOVIL PEDISIC 17-2-0253-2012

6. $x+y^2=6$ $\cancel{x<6}$ $x+y=0$

$y^2=6-x$ $y=-x$

$y=\sqrt{6-x}$



$$\int_2^6 (\sqrt{6-x})+x\,dx=\int_2^6 \sqrt{6}-\sqrt{x}+x\,dx=\sqrt{6}\int_2^6 -x^{\frac{1}{2}}+x\,dx=\sqrt{6}\left(-\int_2^6 x^{\frac{1}{2}}dx+\sqrt{6}\int_2^6 x\,dx\right)=$$

$$=\sqrt{6}\cdot\left(-\frac{2\sqrt{x^3}}{3}+\frac{x^2}{2}\right)\Big|_2^6=\sqrt{6}\cdot\left[(8,202041029)-(0,114381916)\right]=$$

$$=\underline{19,81063804}$$

1. $y''-y'=x^2$

$r_{1,2}=\frac{1\pm\sqrt{1-4}}{2}$ $\frac{1}{2}\pm\frac{\sqrt{5}i}{2}$

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

IME I PREZIME: LOVRE KRESOVIĆ **BROJ INDEKSA:** 56640-2008

0269027501

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
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Ukupno: ∅

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$\int x^\alpha dx = \frac{x^{\alpha+1}}{\alpha+1}, \ \alpha \neq -1$	$\int \tan x \, dx = -\ln \|\cos x\| + C$	$\int \frac{dx}{x^2 - a^2} = \frac{1}{2a} \ln \left\| \frac{x-a}{x+a} \right\| + C$
$\int \frac{dx}{x} = \ln \|x\| + C$	$\int \cot x \, dx = \ln \|\sin x\| + C$	$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln \left\| x + \sqrt{x^2 \pm a^2} \right\| + C$
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IME I PREZIME: ANDRO KLARIN **BROJ INDEKSA:**	Broj ↓ bodova

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
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Ukupno: $\emptyset$

f	$\frac{df}{dx}$
$x^\alpha\ (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
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$\log_\alpha x\ (\alpha > 0)$	$\frac{1}{x \ln \alpha}$
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$\int \frac{dx}{x} = \ln\|x\| + C$	$\int \cot x\, dx = \ln\|\sin x\| + C$	$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln\left\|x + \sqrt{x^2 \pm a^2}\right\| + C$
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MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xoo

IME I PREZIME: Mateja Pećarić **BROJ INDEKSA:** 17-0032-2010

POPUNJAVA NASTAVNIK

Broj ↓ bodova

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
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Ukupno: 0

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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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6. $x + y^2 = 6$

$x + y = 0$

$x + y^2 + x + y = 6$

$2x + 2y^2 = 6$

$x + y^2 = 3$

$\underline{x = 3 - y^2}$

5. $\int_0^1 \frac{2x}{x^2 - x - 2} =$

$2x : x^2 - x - 2 =$

$$4.\ \int_0^2 x\sin x^2\,dx = \left\{\begin{matrix} x^2 = dx & \sin x = dv \\ 2x\,dx = du & \cos x\,dx = du \\ x\,dx = 2du & \end{matrix}\right\}$$

$$1.\ y'' - y' = x^2$$

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

IME I PREZIME: IVAN VELEMIR

BROJ INDEKSA: 17-2-0067-2010

POPUNJAVA NASTAVNIK

Broj ↓ bodova

1. Pronaći opće rješenje ODJ $y'' - y' = x^2$ i provjeriti dobiveno rješenje. 10+5
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4. $\displaystyle\int_0^2 x \sin x^2 \, \mathrm{d}x = ?$ 20
5. $\displaystyle\int_0^1 \frac{2x}{x^2 - x - 2} = ?$ 15
6. Izračunati površinu područja omeđenog krivuljama $x + y^2 = 6$ i $x + y = 0$. 20

Ukupno: ∅

f	$\frac{\mathrm{d}f}{\mathrm{d}x}$
$x^\alpha \ (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
$\log_\alpha x \ (\alpha > 0)$	$\frac{1}{x \ln \alpha}$
e^x	e^x
$\alpha^x \ (\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
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$\tan x$	$\frac{1}{\cos^2 x}$
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Tablica nekih integrala

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

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** xoo	POPUNJAVA NASTAVNIK
IME I PREZIME: DENIS ILIĆ **BROJ INDEKSA:** 56134-2008	Broj ↓ bodova

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Ukupno: 0

f	$\frac{df}{dx}$
$x^\alpha \ (\alpha \neq 0)$	$\alpha x^{\alpha-1}$
$\ln x$	$\frac{1}{x}$
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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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$\int \sin x \, dx = -\cos x + C$	$\int \sqrt{x^2 \pm a^2}\, dx = \frac{1}{2}\left[x\sqrt{x^2 \pm a^2} \pm a^2 \ln\left(x + \sqrt{x^2 \pm a^2}\right)\right] + C$	
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4. $\int\limits_0^2 x \sin x^2 dx = ?$

$\int\limits_0^2 x \cdot \sin x^2 dx = -\cos x + C$

5. $\int_0^1 \frac{2x}{x^2 - x - 2}$

6. $x + y^2 = 6$ i $x + y = 0$

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

xoo

IME I PREZIME: JOSIP PREDOVAN **BROJ INDEKSA:** 17-1-0126-2012

POPUNJAVA NASTAVNIK

Broj ↓ bodova

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$\int x^\alpha \, dx = \frac{x^{\alpha+1}}{\alpha + 1}, \ \alpha \neq -1$	$\int \tan x \, dx = -\ln \|\cos x\| + C$	$\int \frac{dx}{x^2 - a^2} = \frac{1}{2a} \ln \left\| \frac{x-a}{x+a} \right\| + C$
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