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

IME I PREZIME: ELENA BEG **BROJ INDEKSA:** 17-2-0181-2012

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Pronaći opće rješenje ODJ $4y'' - 4y' = 2x + 3$ i provjeriti dobiveno rješenje. ~~15~~
2. Odrediti lokalne ekstreme funkcije $f(x, y) = \sin x + \cos y$. ~~15~~ 8
3. Pronaći ravninu koja dira graf funkcije $f(x, y) = y\sqrt{x} - y^2 - x + 6y$ povučenu u točki $(4, 1, z_0)$ tog grafa. 15
4. $\int_0^2 2x^2 \cos x \, dx = ?$ 20
5. $\int_0^1 \frac{2x}{x^2 - 4} = ?$ ~~15~~
6. Izračunati površinu područja omeđenog krivuljama $y^2 - 2y - 2 + x = 0$ i $x + y + 1 = 0$. ~~20~~

Ukupno: 43

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
$\alpha^x \ (\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
$\cot x$	$\frac{-1}{\sin^2 x}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arctan x$	$\frac{1}{1+x^2}$

Tablica nekih integrala

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

$C_1 e^{r_1 x} + C_2 e^{r_2 x}$

1.

$4y'' - 4y' = 2x + 3$

$4r^2 - 4r = 0$

$r_{1,2} = \frac{4 \pm \sqrt{16 - 4 \cdot 0 \cdot 4}}{2 \cdot 4}$

$r_{1,2} = \frac{4 \pm 4}{8}$ $\quad r_1 = 1 \quad r_2 = 0$

$y_H = C_1^{r_1 x} + C_2^{r_2 x}$

$y_H = C_1^{x} + C_2$

$= C_1 e^x + C_2$

$g(x) = 2x + 3$ $\quad g(x) = e^{\alpha x}\left(P_m(x)\cos(\beta x) + Q_m(x)\sin(\beta x)\right)$

$= e^{0 \cdot x}\left((2x+3)\cos(0 \cdot x) + 0 \cdot \sin(0 \cdot x)\right)$

$\alpha = 0 \quad m = 1 \quad \beta = 0 \quad m = 0$

$N = 1 \quad \alpha + \beta i = 0 \quad k = 1$

$y_p = x^k e^{\alpha x}\left(S_N(x)\cos(\beta x) + T_N(x)\sin(\beta x)\right)$

$y_p = x^1 e^{0 \cdot x}\left((Ax + B)\cos(0 \cdot x) + (Cx + D)\cancel{\sin(0 \cdot x)}\right)$

$y_p = x(Ax + B)$

$\boxed{y_p = Ax^2 + Bx}$ ✓ $\quad \boxed{y_p' = 2Ax + B} \quad \boxed{y_p'' = 2A}$

$4\cdot(2A) - 4(2Ax + B) = 2x + 3$

$8A - 8Ax - 4B = 2x + 3$

uz x: $-8A = 2 \;/ : (-8)$ $\boxed{A = -\frac{1}{4}}$

samo: $8A - 4B = 3$

$8\cdot(-\frac{1}{4}) - 4B = 3$

$-2 - 4B = 3$

$-4B = 3 + 2$

$-4B = 5 \;/ : (-4)$

$\boxed{B = -\frac{5}{4}}$

$y_p = Ax^2 + Bx$

$\boxed{y_p = -\frac{1}{4}x^2 - \frac{5}{4}x}$

$y = y_H + y_P$

$\boxed{y = C_1{}^x + C_2 - \frac{1}{4}x^2 - \frac{5}{4}x}$

(2.) $f(x,y) = \sin x + \cos y$

$\frac{\partial f}{\partial x} = \cos x$ $\frac{\partial f}{\partial y} = -\sin y$

$\cos x = 0$ $-\sin y = 0$

$x = \frac{\pi}{2} + k\pi$, za $k \in \mathbb{Z}$ $y = 0 + k\pi$ za $k \in \mathbb{Z}$

$T(\frac{\pi}{2}, 0) \rightarrow$ STACIONARNA TOČKA

PROPUSTILI STE LOKALNI MINIMUM U $T(\frac{3\pi}{2}, \pi)$

$\frac{\partial^2 f}{\partial x^2} = -\sin x = A$ $\frac{\partial^2 f}{\partial y^2} = -\cos y = C$

$\frac{\partial^2 f}{\partial x \partial y} = 0 = B$

$\Delta = AC - B^2 = (-\sin(\frac{\pi}{2}))\cdot(-\cos 0) - 0$

$= -1\cdot(-1) - 0 = 1$

8

$\Delta(T) > 0$

$A = -1 < 0$

$f(\frac{\pi}{2}, 0) = \sin(\frac{\pi}{2}) + \cos 0 =$

$= 1 + 1 = 2$

$T(\frac{\pi}{2}, 0) \rightarrow$ LOKALNI MAXIMUM

$\hookrightarrow$ točka u kojoj maximum postiže svoju vrijednost.

$T(\frac{\pi}{2}, 0, 2)$

(3.) $f(x,y) = y\sqrt{x} - y^2 - x + 6y$

$T(4, 1, z_0) \rightarrow 1\cdot\sqrt{4} - 1 - 4 + 6\cdot 1 = z_0$

$\boxed{3 = z_0}$ $\boxed{T(4, 1, 3)}$

$\frac{\partial f}{\partial x} = \frac{y}{2\sqrt{x}} - 1$

$\boxed{f_x(T)} = \frac{1}{2\sqrt{4}} - 1 = \boxed{-\frac{3}{4}}$

Rt... $z - z_0 = f_x(T)(x - x_0) + f_y(T)(y - y_0)$

Rt... $z - 3 = -\frac{3}{4}(x - 4) + 6(y - 1)$

$\frac{\partial f}{\partial y} = \sqrt{x} - 2y + 6$

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

$\boxed{f_y(T)} = \sqrt{4} - 2\cdot 1 + 6$

$= 2 - 2 + 6$

$= \boxed{6}$

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

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

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

15

$D_f = \mathbb{R}$

17-2-0181-2012

(4.) $\int_0 2x^2 \cos x \, dx =$

$$\left[\begin{array}{ll} u = 2x^2 & dv = \cos x \, dx \\ du = 4x\,dx & v = \int \cos x \, dx \\ & v = \sin x + C \end{array}\right] = 2x^2 \sin x - \int 4x \sin x \, dx =$$

$$\left[\begin{array}{ll} u = 4x & dv = \sin x \, dx \\ du = 4\,dx & v = -\cos x + C \end{array}\right] =$$

$$= 2x^2 \sin x + 4x \cos x + \int 4 \cos x \, dx =$$

$$= 2x^2 \sin x + 4x \cos x - 4 \int \cos x \, dx =$$

$$= 2x^2 \sin x + 4x \cos x - 4 \sin x + C \Big|_0^2$$

$$= 2 \cdot 4 \sin 2 + 4 \cdot 2 \cos 2 - 4 \cdot \sin 2 - (4 \cdot 0 \sin 0 + 4 \cdot 0 \cos 0 - 4 \cdot \sin 0)$$

$$= 0{,}3080150149 - 0 = \boxed{0{,}3080150149}$$ ✓ 20

(5.) $\int_0^1 \frac{2x}{x^2-4} \, dx$

$x^2 - 4 \neq 0$

$x^2 \neq 4$

$x \neq \pm 2$ ✓

$$\int_0^1 \frac{2x}{x^2-4} \, dx = \left[\begin{array}{lll} t = x^2 - 4 & za\ x = 1 \rightarrow & t = 1 - 4 \\ dt = 2x\,dx & & t = -3 \\ & za\ x = 0 \rightarrow & t = 0 - 4 \\ & & t = -4 \end{array}\right]$$

$$\int_{-4}^{-3} \frac{dt}{t} = \left[\ln t\right]_{-4}^{-3} = \left[\ln |x^2 - 4|\right]_{-4}^{-3} =$$

$$= \underline{\ln 5 - \ln 12} = \boxed{-0{,}8754687374}$$ ✗

(6.) $y^2-2y-2+x=0$ $\qquad x+y+1=0$ $\qquad y=x^2+x+c$

$y^2-2y-2=-x$ $\qquad y=-x-1$

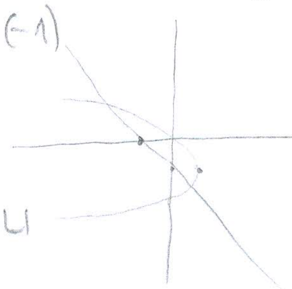
$-x=y^2-2y-2 \quad /\cdot(-1)$

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

$\Downarrow$

ZAMJENA VARIJABLI

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



$-x-1=0$ $\qquad -0-1=y$

$-x=1$ $\qquad -1=y$

$x=-1$ $\qquad (0,-1)$

$(-1,0)$

$-x^2+2x-2=-x-1$

$-x^2+2x+x-2+1=0$

$-x^2+3x-1=0$

$$x_{1,2}=\frac{-3\pm\sqrt{9-4\cdot(-1)\cdot(-1)}}{-2}$$

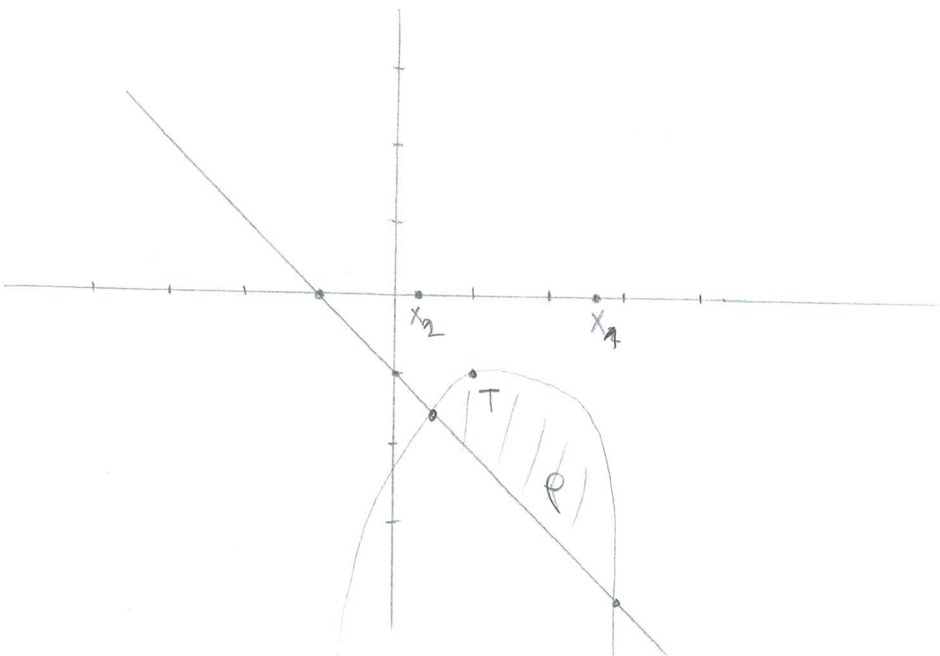
$$x_1=\frac{-3+\sqrt{5}}{-2}=\frac{3-\sqrt{5}}{2}\approx 0{,}3819 \qquad x_2=\frac{-3-\sqrt{5}}{-2}=\frac{3+\sqrt{5}}{2}\approx 2{,}618$$

$\leftarrow$ SJECISTA $\rightarrow$

$\Longrightarrow$

$x_0=-\frac{b}{2a}=\frac{-2}{2\cdot(-1)}=1$ $\qquad T(1,-1)\rightarrow$ tjeme parabole

$y_0=-1+2\cdot 1-2=-1$



ELENA BEG

17-2-0181-2012

(b) $-x^2+2x-2=-x-1$ ✗

$$-x^2+2x+x-2+1=0$$

$$-x^2+3x-1=0 \quad / \cdot (-1)$$

$$x^2-3x+1=0$$

$$x_{1,2}=\frac{3\pm\sqrt{9-4\cdot1\cdot1}}{2}=$$

$$x_1=\frac{3+\sqrt{5}}{2}=2{,}61 \qquad x_2=\frac{3-\sqrt{5}}{2}=0{,}38 \quad \to \text{SJECIŠTA}$$

$$P=\int_{\frac{3-\sqrt{5}}{2}}^{\frac{3+\sqrt{5}}{2}}\left(-x^2+2x-2+x+1\right)dx=\int_{\frac{3-\sqrt{5}}{2}}^{\frac{3+\sqrt{5}}{2}}\left(-x^2+3x-1\right)dx=$$

$$=\left[-\frac{x^3}{3}+\frac{3x^2}{2}-x\right]_{\frac{3-\sqrt{5}}{2}}^{\frac{3+\sqrt{5}}{2}}=$$

$$=\left(-\frac{\left(\frac{3+\sqrt{5}}{2}\right)^3}{3}+\frac{3\cdot\left(\frac{3+\sqrt{5}}{2}\right)^2}{2}-\left(\frac{3+\sqrt{5}}{2}\right)\right)$$

$$=\frac{-9-4\sqrt{5}}{3}+\frac{21+9\sqrt{5}}{4}-\left(\frac{3+\sqrt{5}}{2}\right)=\boxed{\frac{9+5\sqrt{5}}{12}}$$

$$=-\frac{\left(\frac{3-\sqrt{5}}{2}\right)^3}{3}+\frac{3\cdot\left(\frac{3-\sqrt{5}}{2}\right)^2}{2}-\left(\frac{3-\sqrt{5}}{2}\right)=$$

$$=\frac{-9+4\sqrt{5}}{3}+\frac{21-9\sqrt{5}}{4}-\left(\frac{3-\sqrt{5}}{2}\right)=\frac{-9+5\sqrt{5}}{12}$$

$$P=\frac{9+5\sqrt{5}}{12}+\left(-\frac{9+5\sqrt{5}}{12}\right)$$

$$\boxed{P=\frac{5\sqrt{5}}{6}}$$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **Pišite dvostrano!** ixx
Ime i prezime: BRANIMIR PIJACA **Broj indeksa:** 17-2-0086-2011

Popunjava nastavnik

Broj ↓ bodova

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Ukupno: ~~0~~

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

(4) $\int\limits_0^2 2x^2 \cos x \, dx = \left[\begin{array}{ll} u = 2x^2 & dv = \cos x \\ du = 4x\,dx & v = \int \cos x\,dx \\ & v = \sin x \end{array} \right]$

$2x^2 \cdot \sin x - \int\limits_0^2 \sin x \cdot 4x\,dx = \left[\begin{array}{ll} u = 4x & dv = \sin x \\ du = 4 & v = \int \sin x\,dx \\ & v = -\cos x \end{array} \right.$

$2x^2 \cdot \sin x - \left[4x \cdot -\cos x - \int\limits_0 4 \cdot -\cos x \right.$

$2x^2 \cdot \sin x + 4x \cdot \cos x + 4 \sin x \Big|_0^2$ ✗

$2 \cdot 2^2 \cdot \sin(2) + 4 \cdot 2 \cdot \cos(2) + 4 \sin(2) - \left[2 \cdot 0^2 + \sin(0) + 4 \cdot 0 \cdot \cos(0) + 4 \sin(0) \right.$

$= 8.41 - 0 \approx 8.41$ //

~~0~~

⑤ $\int_0^1 \frac{2x}{x^2-4} = \left| \begin{matrix} x^2-4=t \\ 2x\,dx=dt \end{matrix} \right.$

$\int_{-4}^{-3} \frac{dt}{t} =$

-3

$\cancel{\int_{-4}^{-3} \ln(t)} = \ln|x^2-4| \Big|_{-4}^{-3}$

$= \ln|(-3)^2-4| - \ln|(-4)^2-4|$ ∅

$= \ln|5| - \ln|12|$

-10

⑥ $y^2-2y-2+x=0$

$x+y+1=0$

$x=-y-1$

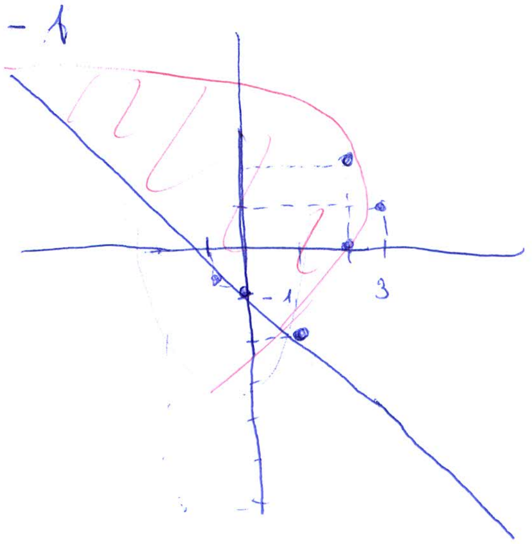
$y^2-2y-2-y-1=0$

$y^2-3y-3=0$

$x_{12} = \frac{3\pm\sqrt{9+12}}{2}$

$x_1 = 3,79 \quad x_2 = -0,79$

$\int_{-0,79}^{3,79}$



$P=0$ Krivulje međusobno ne zatvaraju određenu površinu

x	3	2	2	-1	-6
y	1	0	2	-1	-2

x	-1	0	1
y	0	-1	-2

Branimir Mijoca 17-2-0086-2011

2) $f(xy) = \sin x + \cos \cancel{x}$

$dfx = \cos x \qquad dfy = -\sin y$

$dfxx = -\sin x \qquad dfyy = -\cos y$

$dfxy = 0$

$dfyx = 0$

$\boxed{\cos \frac{\pi}{2} = 0}$

$\cos x \neq 0 \qquad -\sin y = 0$

$\cancel{x \neq} \qquad y = 0$

nema ekstrema

$\cos x \neq 0$

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IME I PREZIME: Nemanja Korda **BROJ INDEKSA:**

POPUNJAVA NASTAVNIK
Broj ↓
bodova

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Ukupno: $\emptyset$

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

1. $4y'' - 4y' = 2x + 3$

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

$\int_0^2 2 \cdot 2x^{2-1} \cdot (-\sin x) \cdot dx$?

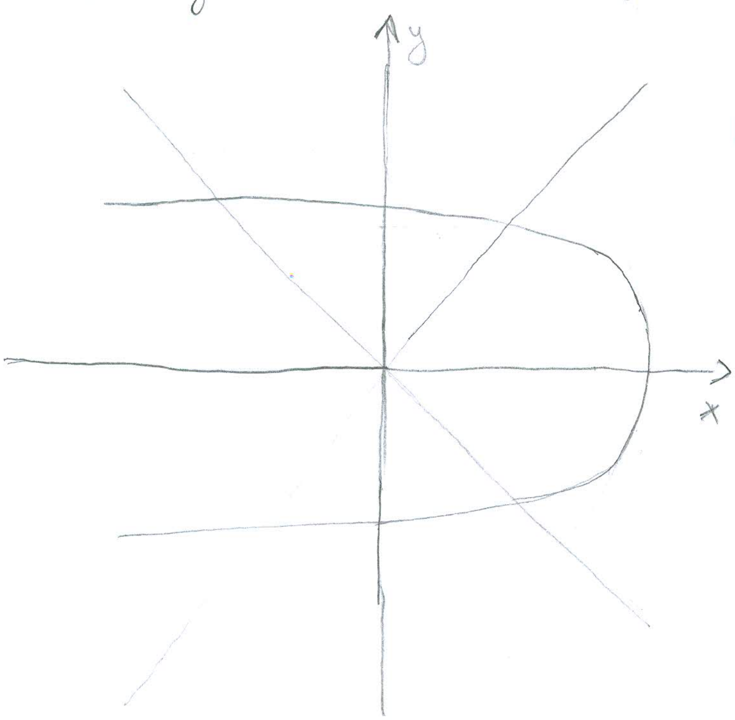
$\int_0^2 4x - \sin x \, dx$

$-4\int_0^2 x - \sin x \, dx$

$\cancel{-4\int_0^2 x \sin x \, dx}$

(3.)

(6.) $y^2 - 2y - 2 + x = 0$ $x + y + 1 = 0$



? $\emptyset$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!** ixx	POPUNJAVA NASTAVNIK
IME I PREZIME: Šimun Zdrilić — **BROJ INDEKSA:** 0269080562	Broj ↓ bodova

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

Ukupno: $\emptyset$

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
$\alpha^x\ (\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
$\cot x$	$\frac{-1}{\sin^2 x}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arctan x$	$\frac{1}{1+x^2}$

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

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

IME I PREZIME: GABRIJELA JORDAN **BROJ INDEKSA:** 17-2-0118-20M

POPUNJAVA NASTAVNIK Broj ↓ bodova

1. Pronaći opće rješenje ODJ $4y'' - 4y' = 2x + 3$ i provjeriti dobiveno rješenje. 15
2. Odrediti lokalne ekstreme funkcije $f(x, y) = \sin x + \cos y$. 15
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4. $\int_0^2 2x^2 \cos x \, dx = ?$ 20
5. $\int_0^1 \frac{2x}{x^2-4} = ?$ 15
6. Izračunati površinu područja omeđenog krivuljama $y^2 - 2y - 2 + x = 0$ i $x + y + 1 = 0$. 20

Ukupno: 0

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

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

IZBAČENA ZBOG "IGRANJA" MOBITELOM

4. $\int_0^2 2x^2 \cos x \, dx$

5. $\int_0^1 \frac{2x}{x^2-4}$

$y^2-2y-2+x=0$; $x+y+1=0$

$y2-2y-2+x=0$ $x+y+1=0$

$y2-2y-2+x=0$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!**	ixx
IME I PREZIME: DAVOR SERTIC	**BROJ INDEKSA:** 0269055501 17-2-0092-2011

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Pronaći opće rješenje ODJ $4y'' - 4y' = 2x + 3$ i provjeriti dobiveno rješenje. 15
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Ukupno: $\emptyset$

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

$\int dx = x + C$	$\int \frac{dx}{a^2+x^2} = \frac{1}{a} \arctan \frac{x}{a} + C$	$\int \frac{dx}{a^2-x^2} = \frac{1}{2a} \ln \left\lvert \frac{a+x}{a-x} \right\rvert + C$
$\int x^\alpha \, dx = \frac{x^{\alpha+1}}{\alpha+1}, \ \alpha \neq -1$	$\int \tan x \, dx = -\ln \lvert \cos x \rvert + C$	$\int \frac{dx}{x^2-a^2} = \frac{1}{2a} \ln \left\lvert \frac{x-a}{x+a} \right\rvert + C$
$\int \frac{dx}{x} = \ln \lvert x \rvert + C$	$\int \cot x \, dx = \ln \lvert \sin x \rvert + C$	$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln \left\lvert x + \sqrt{x^2 \pm a^2} \right\rvert + C$
$\int e^x \, dx = e^x + C$	$\int \frac{dx}{\cos^2 x} = \tan x + C$	$\int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin \frac{x}{a} + C$
$\int a^x \, dx = \frac{a^x}{\ln a} + C$	$\int \frac{dx}{\sin^2 x} = -\cot x + C$	$\int \frac{dx}{\sqrt{2ax-x^2}} = \arccos \left(1 - \frac{x}{a}\right) + C$
$\int \sin x \, dx = -\cos x + C$	$\int \sqrt{x^2 \pm a^2} \, dx = \frac{1}{2} \left[x\sqrt{x^2 \pm a^2} \pm a^2 \ln \left(x + \sqrt{x^2 \pm a^2}\right)\right] + C$	
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(1) PRONAĆI OPĆE RJEŠENJE ODJ $4y'' - 4y' = 2x + 3$ I PROVJERITI DOBIVENO RJEŠENJE.

(2) ODREDITE LOKALNE EKSTREME FUNKCIJE $f(x,y) = \sin x + \cos y$

③ PRONAĆI RAVNINU KOJA DIRA GRAF FUNKCIJE $f(x,y) = y\sqrt{x} - y^2 - x + 6y$ POVUČENU U TOČKI $(4,1,z_0)$ TOG GRAFA

④ $\int_0^2 2x^2 \cos x \, dx = ?$

⑤ $\int_0^1 \frac{2x}{x^2-4} = ?$

⑥ IZRAČUNATI POVRŠINU PODRUČJA OMEĐENOG KRIVULJAMA $y^2 - 2y - 2 + x = 0$ I $x + y + 1 = 0$

MATEMATIKA 2: Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata. **PIŠITE DVOSTRANO!**	ixx
IME I PREZIME: LUKA GULAN	**BROJ INDEKSA:** 0242017133

POPUNJAVA NASTAVNIK
Broj ↓ bodova

1. Pronaći opće rješenje ODJ $4y'' - 4y' = 2x + 3$ i provjeriti dobiveno rješenje. 15
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Ukupno: $\not\emptyset$

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
$\alpha^x\ (\alpha > 0)$	$\alpha^x \ln \alpha$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\frac{1}{\cos^2 x}$
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Tablica nekih integrala		
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$\int x^\alpha \,\mathrm{d}x = \frac{x^{\alpha+1}}{\alpha+1},\ \alpha \neq -1$	$\int \tan x \,\mathrm{d}x = -\ln\lvert\cos x\rvert + C$	$\int \frac{\mathrm{d}x}{x^2 - a^2} = \frac{1}{2a} \ln \left\lvert \frac{x-a}{x+a} \right\rvert + C$
$\int \frac{\mathrm{d}x}{x} = \ln\lvert x\rvert + C$	$\int \cot x \,\mathrm{d}x = \ln\lvert\sin x\rvert + C$	$\int \frac{\mathrm{d}x}{\sqrt{x^2 \pm a^2}} = \ln\left\lvert x + \sqrt{x^2 \pm a^2}\right\rvert + C$
$\int e^x \,\mathrm{d}x = e^x + C$	$\int \frac{\mathrm{d}x}{\cos^2 x} = \tan x + C$	$\int \frac{\mathrm{d}x}{\sqrt{a^2 - x^2}} = \arcsin \frac{x}{a} + C$
$\int a^x \,\mathrm{d}x = \frac{a^x}{\ln a} + C$	$\int \frac{\mathrm{d}x}{\sin^2 x} = -\cot x + C$	$\int \frac{\mathrm{d}x}{\sqrt{2ax - x^2}} = \arccos\left(1 - \frac{x}{a}\right) + C$
$\int \sin x \,\mathrm{d}x = -\cos x + C$	$\int \sqrt{x^2 \pm a^2}\,\mathrm{d}x = \frac{1}{2}\left[x\sqrt{x^2 \pm a^2} \pm a^2 \ln\left(x + \sqrt{x^2 \pm a^2}\right)\right] + C$	
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