Popuniti odmah!

Ime i prezime: ANTONIO MUŽANOVIĆ **Broj indeksa:** 17-2-0031-2010 60

Datum: 8.9.2011. **Vrijeme: od** 9:30 **do** .

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj ↓ bodova
Riješiti: $\int (x^2+1)\cos(x^3+3x)\,\mathrm{d}x$	10 ✓
Odrediti površinu između parabole $y = x^2+3x+1$ i pravca $y=-x+6$.	15 ✓
Odrediti Taylorov razvoj funkcije $f(x) = x^3+3x-4$ oko točke $x_0 = 1$.	~~15~~ ? 0
Ispitati ekstreme funkcije $f(x,y) = x^2+y^2-2xy-2y+1$.	~~20~~ ✓ 15
Riješiti: $\int \frac{x^3+1}{x^3+x}\,\mathrm{d}x$.	~~20~~ ? 0
Riješiti: $y''+4y'-5y=\cos x$.	20 ?

(2.) $y=x^2+3x+1$ PARABOLA ∪

$y=-x+6$

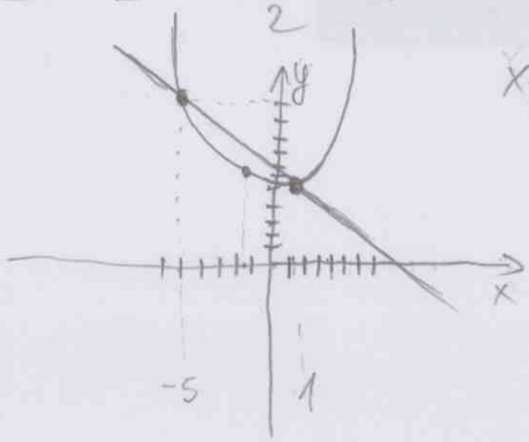
$x^2+3x+1=-x+6$

$x^2+3x+x+1-6=0$

$x^2+4x-5=0$

$x_{1,2}=\frac{-4\pm\sqrt{16+20}}{2}=\frac{-4\pm\sqrt{36}}{2}\Rightarrow$ $x_1=\frac{-4+6}{2}=1$ $\Rightarrow y_1=5$ $T_1(1,5)$

$x_2=\frac{-4-6}{2}=-5$ $y_2=11$ $T_2(-5,11)$



TJEME PARABOLE

$y'(x)=0$

$y'(x)=2x+3$

$2x+3=0$

$2x=-3$

$x_1=-\frac{3}{2}\to y=-\left(-\frac{3}{2}\right)+6=\frac{3}{2}+6=\frac{3}{2}+\frac{12}{2}=\frac{15}{2}$

$T_3\left(-\frac{3}{2},\frac{15}{2}\right)\to$ TJEME ? (MOŽDA I NIJE)

~~20~~ 15

$P=\int_{-5}^{1}\left(-x+6-(x^2+3x+1)\right)dx = \int_{-5}^{1}(-x+6-x^2-3x-1)\,dx=\int_{-5}^{1}(-x^2-4x+5)\,dx$ ✓

$P=\int_{-5}^{1}(-x^2)\,dx-4\int_{-5}^{1}x\,dx+\int 5\,dx=-\frac{x^3}{3}\Big|_{-5}^{1}-4\frac{x^2}{2}\Big|_{-5}^{1}+5x\Big|_{-5}^{1}$

$P=\left(-\frac{1}{3}-\left(\frac{125}{3}\right)\right)-2(1-25)+5(1+5)=-\frac{126}{3}+48+30=-42+48+30=$

$P=36$ ✓

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3.) $f(x)=x^3+3x-4$

$x_0=1$

$$\sum_{n=0}^{\infty}\frac{f^{(n)}(x_0)}{n!}(x-x_0)^n$$

$f(x)=x^3+3x-4 \quad f(1)=1+3-4=0$

$f'(x)=3x^2+3 \quad f(1)=6$

$f''(x)=6x \quad f(1)=6$

$f'''(x)=6$

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

$\cancel{f}\ f'''(0)=?$

$1!=1$

$2!=2$

$3!=6$

TAYLOROV RAZVOJ $= f(x)+f'(x)+f''(x)+f'''(x)+f^{(4)}(x)+\ldots\ldots = \frac{0}{1}(x-1)^1+\frac{6}{2}(x-1)^2+\frac{6}{6}(x-1)^3+$

$+\frac{0}{24}(x-1)^4+\ldots\ldots=$

$=0+3(x-1)^2+(x-1)^3+0(x-1)^4+\ldots=$

$=3(x-1)^2+(x-1)^3=3(x^2-2x+1)+x^3-2x^2-2x+1=$

$=3x^2-6x+3+x^3-2x^2-2x+1$

TAYLOROV RAZVOJ $=x^3+x^2-8x+4$ //

$\cancel{f}\ x^3+3x-4=0+\frac{6}{1}(x-1)^1+\frac{6}{2}(x-1)^2+\frac{6}{6}(x-1)^3$

$=0+6(x-1)+3(x-1)^2+(x-1)^3$

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4. $f(x,y) = x^2+y^2-2xy-2y+1$

$$\frac{\partial f}{\partial x} = \frac{\partial}{\partial x}(x^2+y^2-2xy-2y+1) = 2x-2y \Rightarrow 0$$

$$\frac{\partial f}{\partial y} = \frac{\partial}{\partial y}(x^2+y^2-2xy-2y+1) = 2y-2x-2 \Rightarrow 0$$

$2x-2y=0$
$2x=2y$
$\boxed{x=y}$

$2y-2x-2=0$
$2y-2y-2=0$
$-2=0$

$\partial_{xx} = 2$

$\partial_{yx} = -2$

$\partial_{yy} = 2$

FUNKCIJA NEMA EKSTREMA

NEMA KRITIČNIH TOČAKA

$\Delta = AC - B^2 = 4-4=0 \Rightarrow$ NE POSTOJE EKSTREMI JER SE IZ $\Delta=0$ NE MOŽE NIŠTA IŠČITATI.

POGREŠNO

NE POSTOJE EKSTREMI JER NEMA KRITIČNIH TOČAKA

15

5. $\int \frac{x^3+1}{x^3+x}dx$ SVESTI NA TABLIČNI!

RIJEŠITI KAO INTEGRAL RACIONALNE FUNKCIJE

$$\int \frac{x^3+1}{x^3+x}dx = \int \frac{x^3}{x^3+x}dx + \int \frac{1}{x^3+x}dx \quad (*)$$

$$\int \frac{x^3}{x^3+x}dx = \int \frac{x^3+x-x}{x^3+x}dx = \int \frac{\cancel{x^3+x}}{\cancel{x^3+x}}dx - \int \frac{x}{x^3+x}dx =$$

$$= \int 1dx - \int \frac{\cancel{x}}{\cancel{x}(x^2+1)}dx = x - \int \overset{\text{TABLIČNI}}{\frac{dx}{x^2+1^2}} = x - 1\arctan x + C$$

$$\int \frac{1}{x^3+x}dx = \int \frac{1}{x(x^2+1)}dx = \int \frac{x+1-x}{x(x^2+1)}dx = \int \frac{\cancel{x}}{\cancel{x}(x^2+1)}dx + \int \frac{1-x}{x(x^2+1)}dx =$$

TABLIČNI

$$= 1\arctan x + C + 1\int \frac{\cancel{x}}{\cancel{x}(x^2+1)}dx = \arctan x + C - 1\int \frac{dx}{(x^2+1)} =$$

$$= \arctan x + C - \arctan x + C = 2C = C$$

$$(*) \int \frac{x^3+1}{x^3+x}dx = x - \arctan x + C + C = x - \arctan x + D$$

∅

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6. $y'' + 4y' - 5y = \cos x$

$\boxed{y = y_0 + Y}$

1.) HOMOGENUT

$y'' + 4y' - 5y = 0$

$\lambda^2 + 4\lambda - 5 = 0$

$\lambda_{1,2} = \frac{-4 \pm \sqrt{16+20}}{2} = \frac{-4 \pm \sqrt{36}}{2} = \frac{-4 \pm 6}{2}$

$\lambda_1 = 1,\quad \lambda_2 = -5 \quad \}$ RAZLIČITI

$y_0(x) = C_1 e^{x} + C_2 e^{-5x}$ ✓

2.)

$f(x) = \cos x = e^{ax}(P_m(x) \cos bx + Q_m(x) \sin bx)$

$a = 0$
$b = 1$
$P_{(m)}(x) = 1$
$Q_{(m)}(x) = 0$

$a \pm bi = 0 \pm i = \pm i$

$a \neq \lambda_1, \lambda_2$

$r = 0$ ✓

$Y = A\cos x + B\sin x$ $A = -\frac{3}{26}$ $B = \frac{1}{13}$

$Y' = (A'\cos x + A\cos x' + B'\sin x + B\sin x')$

$Y' = 0 + A\cdot(-\sin x) + 0 + B\cos x$

$Y' = -A\sin x + B\cos x$ ✓

$Y'' = -A\cos x + B(-\sin x)$

$Y'' = -A\cos x - B\sin x$ ✓

$Y'' + 4Y' - 5Y = \cos x$

$-A\cos x - B\sin x + 4(-A\sin x + B\cos x) - 5(A\cos x + B\sin x) = \cos x$

$-A\cos x - B\sin x - 4A\sin x + 4B\cos x - 5A\cos x - 5B\sin x = \cos x$

$(-A + 4B - 5A)\cos x + (-B - 4A - 5B)\sin x = \cos x$ } UZ $\cos x$ JE 1, UZ $\sin x$ JE 0

$-6A + 4B = 1 \to -6A + 4(-\frac{2}{3}A) = 1 \to -6A - \frac{8}{3}A = 1$

$-6B - 4A = 0 \to -6B = 4A$

$B = -\frac{4A}{6} = -\frac{2}{3}A$

$\frac{-18-8}{3}A = 1 \to -\frac{26}{3}A = 1 \ /:(-\frac{26}{3})$

$B = -\frac{2}{3}\cdot(-\frac{3}{26}) = \frac{6}{78} = \frac{1}{13}$ $A = -\frac{3}{26}$

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6. NASTAVAK

$$Y = A\cos x + B\sin x = -\frac{3}{26}\cos x + \frac{1}{13}\sin x$$

$$y = \underbrace{C_1 e^{x} + C_2 e^{-5x}}_{y_{0h}} + \underbrace{-\frac{3}{26}\cos x + \frac{1}{13}\sin x}_{Y}$$

20

(1.) $\int (x^2+1)\cos(x^3+3x)\,dx = \left\{ \begin{array}{l} u = x^3+3x \\ du = (3x^2+3)\,dx \end{array} \right\} = \frac{1}{3}\underbrace{\int 3(x^2+1)\cos u\,dx}_{\text{OVO JE ZAPRAVO } \int (x^2+1)\cos u\,dx} =$

$du = 3(x^2+1)\,dx$

$$= \frac{1}{3}\int \cancel{3}(x^2+1)\cos u\,dx = \frac{1}{3}\int \cos u\,du = \frac{1}{3}\cdot \sin u + C = \underline{\frac{1}{3}\sin(x^3+3x)}$$

PROVJERA:

10

$$\left(\frac{1}{3}\sin(x^3+3x)\right)' = \frac{1}{3}\cdot(\sin(x^3+3x))' = \frac{1}{3}\cdot\left(\cos(x^3+3x)\cdot(3x^2+3)\right) =$$

$$= \frac{1}{3}\left(3x^2\cos(x^3+3x) + 3\cos(x^3+3x)\right) = \frac{1}{3}\left(3\cos(x^3+3x)(x^2+1)\right)$$

$$= \cos(x^3+3x)(x^2+1)$$ TOČNO!

Popuniti odmah!

IME I PREZIME: Ante Dujević BROJ INDEKSA: 57641 35

DATUM: 8.09.2011. VRIJEME: OD 9:00h DO .

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj bodova
1. Riješiti: $\int (x^2+1)\cos(x^3+3x)\,dx$	~~10~~ Ø
2. Odrediti površinu između parabole $y = x^2+3x+1$ i pravca $y = -x+6$.	15
3. Odrediti Taylorov razvoj funkcije $f(x) = x^3+3x-4$ oko točke $x_0 = 1$.	~~15~~ Ø
4. Ispitati ekstreme funkcije $f(x,y) = x^2+y^2-2xy-2y+1$.	20
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,dx$.	20
6. Riješiti: $y''+4y'-5y = \cos x$.	~~20~~ Ø

2.

$y = x^2+3x+1$

$y = -x+6$

$x^2+3x+1 = -x+6$

$x^2+3x+1+x-6=0$

$x^2+4x-5=0$

$x_{1,2} = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$a=1 \quad b=4 \quad c=-5$

$x_{1,2} = \frac{-4\pm\sqrt{16-4\cdot1\cdot(-5)}}{2} = \frac{-4\pm\sqrt{16+20}}{2}$

$x_{1,2} = \frac{-4\pm 6}{2}$

$x_1 = \frac{-4+6}{2} = 1$ ✓

$x_2 = \frac{-4-6}{2} = -5$ ✓

$y_1 = -x_1+6 = -1+6 = 5$

$y_2 = -x_2+6 = -(-5)+6 = 11$

$T_1(1,5) \quad T_2(-5,11) \quad T_3\left(-\frac{3}{2}, \frac{31}{4}\right)$

$y' = x^2+3x+1$

$y' = 2x+3+0$

$y' = 2x+3$

$y'=0 \Rightarrow 2x+3=0$

$2x=-3$

$x = -\frac{3}{2}$

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

$y = \frac{9}{4}+\frac{9}{2}+1 = \frac{9+18+4}{4} =$

$y = \frac{31}{4}$

$P = \int_{-5}^{1}\left[(-x+6)-(x^2+3x+1)\right] = \int_{-5}^{1} -x+6-x^2-3x-1$

$= \int_{-5}^{1} -x^2-4x+5$ ✓ $= -\frac{x^3}{3} - \frac{\cancel{4}^{2}x^2}{\cancel{2}_{1}}+5x\Big|_{-5}^{1} = -\frac{x^3}{3}-2x^2+5x\Big|_{-5}^{1}$

$P = \left(-\frac{1^3}{3}-2\cdot1^2+5\cdot1\right)-\left(-\frac{(-5)^3}{3}-2\cdot(-5)^2+5\cdot(-5)\right) =$

$P = \left(-\frac{1}{3}-2+5\right)-\left(\frac{125}{3}-50+(-25)\right) =$

$= \frac{8}{3}+\frac{100}{3} = \frac{108}{3} = 36$ ✓

~~36~~ 15

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4. $f(x,y) = x^2+y^2-2xy-2y+1$

$d_xf = 2x+0-2\cdot1\cdot y-0+0$

$d_xf = 2x-2y$ ✓

$d_{xx}f = 2-0 = 2$ ✓

$d_{xy}f = 0-2\cdot1 = -2$ ✓

$d_{yx}f = -2$

$d_yf = 0+2y-2x\cdot1-2+0$

$d_yf = 2y-2x-2$ ✓

$d_{yy}f = 2-0-0 = 2$ ✓

$d_xf = 0$

$d_yf = 0$

$2x-2y=0$ ✓

$2y-2x-2=0$ ✓

$\cancel{2x}-2y=0$

$\cancel{-2x}+2y-2=0$

$\cancel{-2y}+\cancel{2y}-2=0$

$-2=0$

FUNKCIJA NEMA EKSTREMA ✓

20

1. $\int(x^2+1)\cos(x^3+3x)dx = \left[\begin{array}{ll} u=x^2+1 & dv=\cos x^3+\cos 3x \\ 2xdx=du & v=\int\cos x^3+\int\cos 3x \\ & V=\sin x^3+\sin 3x \end{array}\right]$

$= x^2+1\cdot\sin x^3+\sin 3x-\int\sin x^3+\sin 3x\cdot 2x$ ✗

∅

SUPSTITUCIJA $\left\{\begin{array}{l} t=x^3+3x \\ dt=3(x^2+1)dx \end{array}\right\} = \int\cos t\,\frac{dt}{3}$

$=\frac{1}{3}\sin t+C$

$=\frac{1}{3}\sin(x^3+3x)+C$

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6. $y'' + 4y' - 5y = \cos x$

$a = 1$
$b = 4$
$c = -5$

$$\lambda_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\lambda_{1,2} = \frac{-4 \pm \sqrt{16 - 4 \cdot 1 \cdot (-5)}}{2} = \frac{-4 \pm \sqrt{16+20}}{2} = \frac{-4 \pm 6}{2}$$

$$\lambda_1 = \frac{-4+6}{2} = \underline{1}$$

$$\lambda_2 = \frac{-4-6}{2} = \underline{\underline{-5}}$$

$y(x) = (C_1 + C_2 x) e^{\lambda x}$ ×

$f(x) = \cos x$

?

0

Ime i prezime: ANTE DUŠEVIĆ Broj indeksa: 57641

$f(x) = x^3 + 3x - 4$ $x_0 = 1$

$f'(x) = 3x^2 + 3 - 0$ $f'(x_0) = 3 \cdot 1^2 + 3 = 6$

$f'(x) = 3x^2 + 3$ $f''(x_0) = 6$

$f''(x) = 6x$

$f'''(x) = 6 \cdot 1 = 6$ ✓ $f(x_0) = 1^3 + 3 \cdot 1 - 4 = 1 + 3 - 4 = 0$

$f^{IV}(x) = 0$ $f'''(x_0) = 0$ ✗ $f'''(0) = 6$

$f(x) = f(x_0) + \frac{f'(x_0)}{1!}(x - x_0) + \frac{f''(x_0)}{2!}(x - x_0)^2 + \frac{f'''(x_0)}{3!}(x - x_0)^3$

$f(x) = 0 + \frac{6}{1}(x - 1) + \frac{6}{2}(x - 1)^2 + \frac{6}{6}(x - 1)^3$

$f(x) = 6(x - 1) + 3(x - 1)^2$

$= 6x - 6 + 3x - 3 = 9x - 9$ ✗

$\emptyset$

Popuniti odmah!

IME I PREZIME: NINO MIKULANDRA BROJ INDEKSA: 57645 25

DATUM: VRIJEME: OD $09^{h}35^{min}$ DO .

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj ↓ bodova
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2. Odrediti površinu između parabole $y = x^2+3x+1$ i pravca $y = -x+6$.	15
3. Odrediti Taylorov razvoj funkcije $f(x) = x^3+3x-4$ oko točke $x_0 = 1$.	15
4. Ispitati ekstreme funkcije $f(x,y) = x^2+y^2-xy-2y+1$.	~~20~~ 10
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,\mathrm{d}x$.	~~20~~ 0
6. Riješiti: $y''+4y'-5y = \cos x$.	20

2.)

$$y = x^2 + 3x + 1$$
$$y = -x + 6$$

$$x^2 + 3x + 1 = -x + 6$$
$$x^2 + 3x + x + 1 - 6 = 0$$
$$x^2 + 4x - 5 = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} =$$

$$x_{1,2} = \frac{-4 \pm \sqrt{4^2 - 4\cdot 1 \cdot (-5)}}{2 \cdot 1} =$$

$$x_{1,2} = \frac{-4 \pm \sqrt{16+20}}{2} = \frac{-4 \pm \sqrt{36}}{2} = \frac{-4 \pm 6}{2}$$

$$x_1 = \frac{-4-6}{2} = -5$$

$$x_2 = \frac{-4+6}{2} = 1$$

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$y' = 0$

$y = x^2 + 3x + 1$

$y = 2x + 3$

$0 = 2x = 3 \;/ :(-2)$

$x = -\frac{3}{2} \approx (-1,5)$

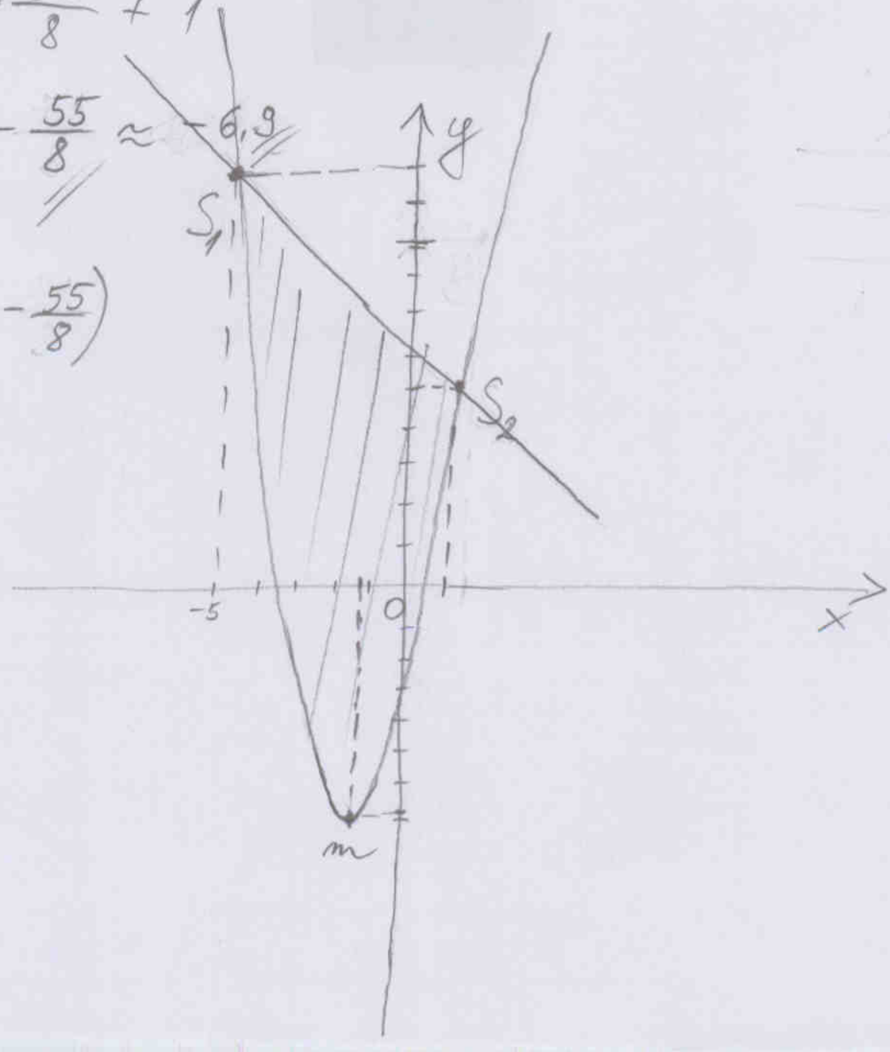
$y\left(-\frac{3}{2}\right) = \left(-\frac{3}{2}\right)^2 + 3 \cdot \left(-\frac{3}{2}\right) + 1$

$y \doteq -\frac{27}{8} - \frac{9}{2} + 1$

$y = -\frac{63}{8} + 1$

$y = -\frac{55}{8} \approx -6,9$

$m\left(-\frac{3}{2}, -\frac{55}{8}\right)$



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$$y = x^2 + 3x + 1$$

$$y = (-5)^2 + 3 \cdot (-5) + 1$$

$$y = 25 - 15 + 1$$

$$y = 11$$

$$S_1(-5, 11)$$

$$y = x^2 + 3x + 1$$

$$y = 1^2 + 3 \cdot 1 + 1$$

$$y = 1 + 3 + 1$$

$$y = 5$$

$$S_2(1, 5)$$

N.T.

$$y = 0$$

$$y = x^2 + 3x + 1$$

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

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} =$$

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

$$x_{1,2} = \frac{-3 \pm \sqrt{-27 - 4}}{2} = \frac{-3 \pm \sqrt{31}\, i}{2} \quad \nexists \text{ N.T.}$$

$$a = 1 > 0 \quad \underset{min}{\cup}$$

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$$P = \int_{-5}^{1} \left(-x + 6 - (x^2 + 3x + 1 \right) dx =$$

$$P = \int_{-5}^{1} \left(-x + 6 - x^2 - 3x - 1 \right) dx =$$

$$P = \int_{-5}^{1} \left(-x^2 - 3x - x + 6 - 1 \right) dx =$$

$$P = \int_{-5}^{1} \left(-x^2 - 4x + 5 \right) dx$$

$$P = -\int_{-5}^{1} x^2 dx - 4\int_{-5}^{1} x dx + 5\int_{-5}^{1} dx$$

$$P = -\frac{x^3}{3} - 4\frac{x^2}{2} + 5x \Big|_{-5}^{1} =$$

$$P = -\frac{1}{3}^3 - 4\frac{1}{2}^2 + 5 \cdot 1 - \left(-\frac{(-5)^3}{3} - 4\frac{(-5)^2}{2} + 5 \cdot (-5) \right) =$$

$$P = -\frac{1}{3} + 2 + 5 - \left(-\left(-\frac{125}{3}\right) - 50 - 25 \right) =$$

$$P = -\frac{1}{3} + 2 + 5 - \frac{125}{3} + 50 + 25 =$$

$$P = -0,33 + 2 + 5 - 41,7 + 50 + 25 =$$

$$P = 40,63 \text{ jed}^2$$

~~[illegible]~~

15

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4.) $f(x,y) = x^2 + y^2 - xy - 2y + 1$

domena: $\mathcal{D}(f) = \mathbb{R} \times \mathbb{R} = \mathbb{R}^2$

y const. $\frac{\partial f}{\partial x} = 2x - y$

x const. $\frac{\partial f}{\partial y} = 2y - x - 2$

$$(*) \begin{cases} 2x - y = 0 \checkmark \\ 2y - x - 2 = 0 \checkmark \Rightarrow x = -2y + 2 \times \end{cases}$$

$$2 \cdot (-2y + 2) - y = 0$$

$$-4y + 4 - y = 0$$

$$-5y = -4 \quad / : (-5)$$

$$y = \frac{4}{5}$$

TREBALO JE UVRSTITI U JEDNADŽBE (*) I PROVJERITI DA ZADOVOLJAVA

$$x = -2 \cdot \frac{4}{5} + 2$$

$$x = -\frac{8}{5} + 2$$

$$x = \frac{2}{5}$$

$$T\left(\frac{2}{5}, \frac{4}{5}\right)$$

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$$A = \frac{\partial^2 f}{\partial^2 x} = 2$$

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

$$C = \frac{\partial^2 f}{\partial y^2} = 2$$

$$T\left(\frac{2}{5}, \frac{4}{5}\right)$$

$$\Delta \begin{vmatrix} A & B \\ B & C \end{vmatrix} = 2 \cdot 2 - (-1)^2 =$$

10

$$= 4 - 1$$

$$= 3 > 0 \quad \exists \text{ ekstrem}$$

$$A = 2 > 0 \quad \Rightarrow \min$$

$$Z_{min}\left(\overset{x}{\frac{2}{5}}, \overset{y}{\frac{4}{5}}\right) = x^2 + y^2 - xy - 2y + 1$$

$$= \left(\frac{2}{5}\right)^2 + \left(\frac{4}{5}\right)^2 - \left(\frac{2}{5}\right) \cdot \left(\frac{4}{5}\right) - 2 \cdot \left(\frac{4}{5}\right) + 1$$

$$= \frac{4}{25} + \frac{16}{25} - \frac{8}{25} - \frac{8}{5} + 1 =$$

$$= -\frac{3}{25}$$

$\Rightarrow$

IME I PREZIME: NINO MIKULANDRA BROJ INDEKSA: 57645

5.) $\int \frac{x^3+1}{x^3+x}\,dx$

$$(x^3+1):(x^3+x) = 1 + \frac{x}{x^3+x}$$
$$\underline{\pm x^3 \pm x}$$
$$x$$

VIDI ISPOD

$$= \int \left(1 + \frac{x}{x^3+x}\right) dx = \qquad (x^3+x)' = 3x+1$$

$$= \int x + \int \frac{x}{x^3+x}\,dx = \qquad = \frac{1}{3}(3x+1) - \frac{1}{3}$$

$\boxed{\text{FAKTORIZIRATI NAZIVNIK I NAPRAVITI RASTAV NA PARCIJALNE RAZLOMKE}}$

$$= x + \int \frac{\frac{1}{3}(3x+1) - \frac{1}{3}}{x^3+x}\,dx =$$

$$= x + \frac{1}{3}\int \frac{(3x+1)}{x^3+x}\,dx - \frac{1}{3}\int \frac{dx}{x^3+x} =$$

0

$$(\cancel{x^3}+1):(x^3+x) = 1 + \frac{1-x}{x^3+x}$$
$$\underline{\cancel{x^3}+x}$$
$$-x+1$$

Popuniti odmah!

IME I PREZIME: Mateja Mitrović BROJ INDEKSA: 0269037541 (25)

DATUM: VRIJEME: OD 09:30 DO 11:00

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj ↓ bodova
~~1.~~ Riješiti: $\int (x^2+1)\cos(x^3+3x)\,\mathrm{d}x$	~~10~~ 5
~~2.~~ Odrediti površinu između parabole $y = x^2 + 3x + 1$ i pravca $y = -x + 6$.	~~15~~ 10
~~3.~~ Odrediti Taylorov razvoj funkcije $f(x) = x^3 + 3x - 4$ oko točke $x_0 = 1$.	~~15~~ 0
~~4.~~ Ispitati ekstreme funkcije $f(x,y) = x^2 + y^2 - xy - 2y + 1$.	~~20~~ 10
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,\mathrm{d}x$.	20
6. Riješiti: $y'' + 4y' - 5y = \cos x$.	20

Ime i prezime: Mateja Mitrović   7.   Broj indeksa:

④. $f(x,y) = x^2 + y^2 - xy - 2y + 1$

$a > 0$ minimum

$f'(x,y)_x = 2x - y$

$f'(x,y)_y = 2y - x - 2$

$2x - y = 0 \quad 2x = y /:2$

$\underline{2y - x - 2 = 0} \quad x = \frac{1}{2}y$

$2y - \frac{1}{2}y - 2 = 0$

$\frac{3}{2}y - 2 = 0$

$A(\frac{3}{2}, 3)$

$\frac{3}{2}y = 2 / \cdot \frac{3}{2}$

× $\boxed{y = 3}$ $y = \frac{4}{3}$

× $\boxed{x = \frac{1}{2} \cdot 3 = \frac{3}{2}}$ ⇓ $x = \frac{2}{3}$

$f''(x,y)_{xx} = 2$

$f''(x,y)_{xy} = -1$

$f''(x,y)_{yx} = -1$

$f''(x,y)_{yy} = 2$

$H_A = \begin{vmatrix} 2 & -1 \\ -1 & 2 \end{vmatrix} = 4 - 1 = 3$

u točki $A(\frac{3}{2}, 3)$ je lokalni ekstrem minimum

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

$= \frac{9}{4} + 9 - \frac{9}{2} - 6 + 1 =$

$= \frac{9}{4} + 4 - \frac{9}{2} = \frac{7}{4}$

POSTUPAK DOBAR

10

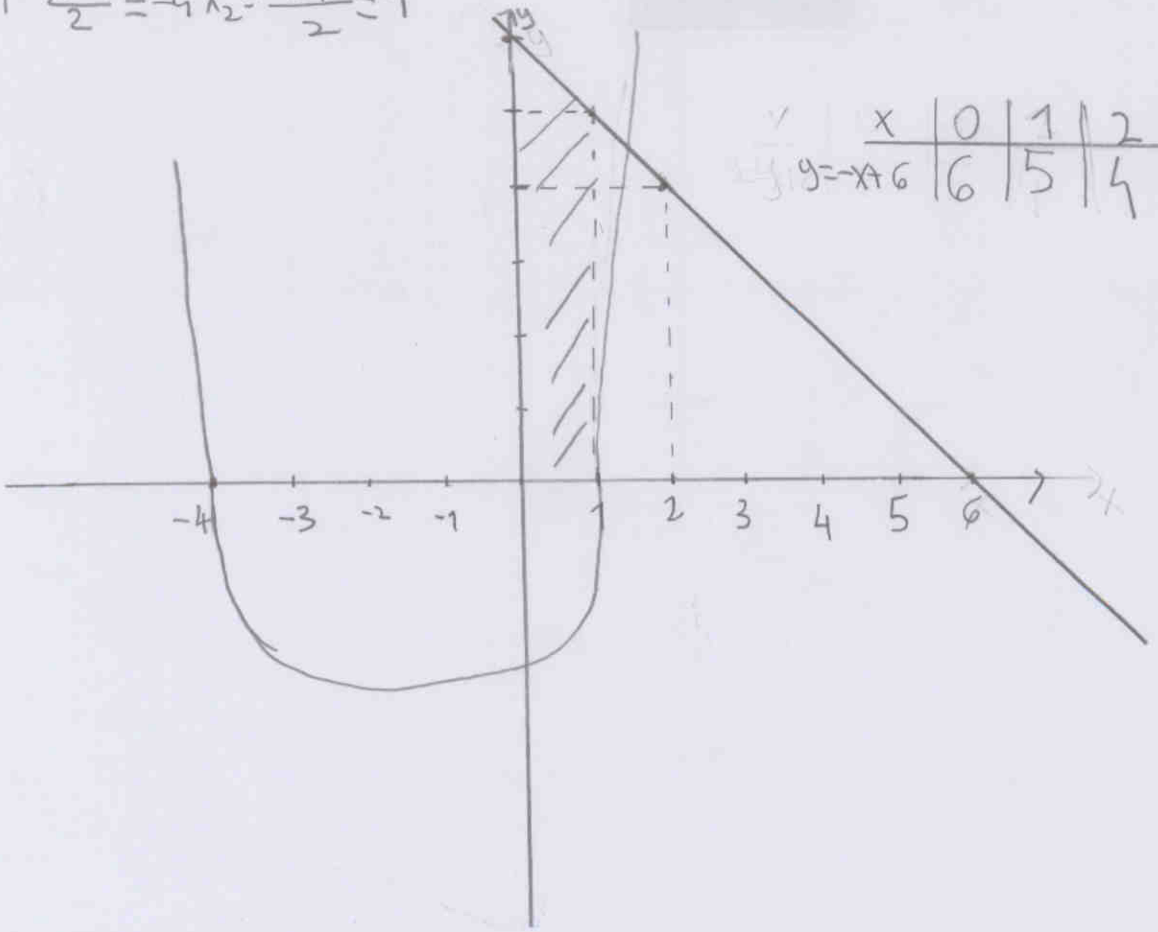
②. $y = x^2 + 3x + 1 \quad y = -x + 6$

$y = x^2 + 3x + 1$

$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1} = \frac{-3 \pm \sqrt{9-4}}{2} = \frac{-3 \pm \sqrt{5}}{2} =$

$a > 0$ ∪

$x_1 = \frac{-3-5}{2} = -4 \quad x_2 = \frac{-3+5}{2} = 1$



x	0	1	2
y=-x+6	6	5	4

⇒ Dalje

2.

Ime i prezime: 2 Mateja Mitrović **Broj indeksa:**

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

$-x+6=0$

$x^2+3x+1=-x+6$

$x^2+3x+1+x-6=0$

$x^2+4x-5=0$

$x_{1,2}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}=\frac{-4\pm\sqrt{4^2-4\cdot1\cdot(-5)}}{2\cdot1}=\frac{-4\pm\sqrt{36}}{2}=\frac{-4\pm6}{2}$

$x_1=\frac{-4-6}{2}=-5 \quad x_2=\frac{-4+6}{2}=1$

$P=\int_{-5}^{1}(-x+6)-(x^2+3x+1)dx=\int_{-5}^{1}-x+6-x^2-3x-1\,dx=\int_{-5}^{1}-x^2+2x+5\,dx=\left(-\frac{x^{2+1}}{2+1}+2\frac{x^{1+1}}{1+1}+5x\right)\Big|_{-5}^{1}$ $-4x$

$P=-\frac{x^3}{3}+2\frac{x^2}{2}+5x\Big|_{-5}^{1}=\left(-\frac{1^3}{3}+2\cdot\frac{1^2}{2}+5\cdot1\right)-\left(-\frac{(-5)^3}{3}+2\cdot\frac{(-5)^2}{2}+5\cdot(-5)\right)$

$=-\frac{1}{3}+1+5+\frac{125}{3}+\frac{25}{2}\cdot2-25$

$=-\frac{1}{3}-19+\frac{125}{3}=\frac{-1-57+125}{3}=\frac{67}{3}$

10

(1)

$\int(x^2+1)\cos(x^3+3x)dx=\left|\begin{array}{l}x^3+3x=t\\(3x^2+3)dx=dt\,|:3x^2+3\\dx=\frac{dt}{3x^2+3}\end{array}\right|=\int(x^2+1)\cdot\cos t\cdot\frac{dt}{3x^2+3}=\int\cos t\,\frac{dt}{6}$?

$=\frac{1}{6}\int\cos t\,dt=\frac{1}{6}\sin t+C=\frac{1}{6}\sin(x^3+3x)+C$

? KRAĆENJE ?

5

(3) $f(x)=x^3+3x-4 \quad x_0=1$

$f'(x)=3x^2+3 \qquad f(x_0)=1^3+3\cdot1-4$ =?

$f''(x)=6x \qquad f(x_0)=1-3-4=-6$

$f'''(x)=6$

$f^{IV}(x)=0$

$f(x)=\frac{3x^2+3}{1!}(x-1)-\frac{6x}{2!}(x-1)-\frac{6}{3!}(x-1)-\frac{0}{4!}(x-1)=3x^2+3(x-1)-3(x-1)-2(x-1)-0$? ? ? ? ?

$\frac{3}{\cancel{6x}}{\underset{1\cdot2}{2!}} \quad \frac{\cancel{6}^{2}}{\underset{1\cdot2\cdot3}{\cancel{3!}}}$

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

0

Popuniti odmah!

IME I PREZIME: PAULO VUKOVIĆ BROJ INDEKSA: 17-2-0040-2040 15

DATUM: 8.9.2011. VRIJEME: OD DO .

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj ↓ bodova
1. Riješiti: $\int (x^2+1)\cos(x^3+3x)\,\mathrm{d}x$	10
2. Odrediti površinu između parabole $y = x^2 + 3x + 1$ i pravca $y = -x + 6$.	15
3. Odrediti Taylorov razvoj funkcije $f(x) = x^3 + 3x - 4$ oko točke $x_0 = 1$.	15
4. Ispitati ekstreme funkcije $f(x, y) = x^2 + y^2 - 2xy - 2y + 1$.	20
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,\mathrm{d}x$.	20
6. Riješiti: $y'' + 4y' - 5y = \cos x$.	20

IME I PREZIME: PAULO VUKOVIĆ BROJ INDEKSA: 17-2-0040-2040

(3.) $f(x) = x^3 + 3x - 4 \qquad x_0 = 1$

$\cancel{f'(x)=}$

$$\sum_{n=0}^{\infty} \frac{f^{(n)}(x_0)}{n!}(x-x_0)^n$$

$f(x) = x^3 + 3x - 4 \qquad f(1) = 1+3-4 = 0$

$f'(x) = 3x^2 + 3 \qquad f'(1) = 6$

$f''(x) = 6x \qquad f''(1) = 6$

$f'''(x) = 6$

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

$\vdots$

$$= \frac{0 \cdot 1}{1} \cdot (x-1)^0 + \frac{6 \cdot 1}{1} \cdot (x-1)^1 + \frac{6 \cdot 1}{2} \cdot (x-1)^2 + \frac{6 \cdot 1}{6} \cdot (x-1)^3 =$$

15 ✓

$$= 0 + 6x - 6 + \frac{\overset{3}{\cancel{6}}(x^2 - 2x + 1)}{\underset{1}{\cancel{2}}} + \frac{\overset{1}{\cancel{6}}(x^3 - 3x^2 + 3x - 1)}{\underset{1}{\cancel{6}}}$$

$= 0 + 6x - 6 + 3(x^2 - 2x + 1) + x^3 - 3x^2 + 3x - 1$

$= \cancel{6x} - 6 + \cancel{3x^2} - \cancel{6x} + 3 + x^3 - \cancel{3x^2} + 3x - 1$

$= -4 + x^3 + 3x$

$(x-1)(x-1) = x^2 - x - x + 1 = x^2 - 2x + 1 \cdot (x-1) =$

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

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

$$x^3 + 3x - 4 = 0 + 6(x-1) + 3(x-1)^2 + (x-1)^3$$

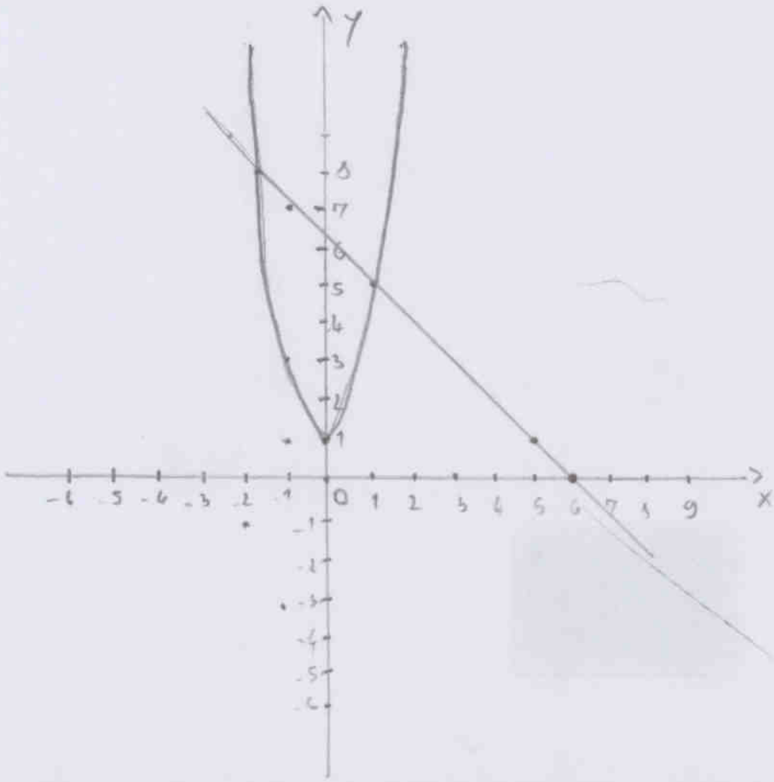
Popuniti odmah!
Ime i prezime: Miro Lukin **Broj indeksa:** 54493-2007 $\emptyset$
Datum: Vrijeme: od do
MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj ↓ bodova
1. Riješiti: $\int (x^2+1)\cos(x^3+3x)\,dx$	~~10~~ $\emptyset$
2. Odrediti površinu između parabole $y = x^2+3x+1$ i pravca $y = -x+6$.	~~15~~ $\emptyset$
3. Odrediti Taylorov razvoj funkcije $f(x) = x^3+3x-4$ oko točke $x_0 = 1$.	15
4. Ispitati ekstreme funkcije $f(x, y) = x^2+y^2-xy-2y+1$.	20
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,dx$.	20
6. Riješiti: $y''+4y'-5y = \cos x$.	20

IME I PREZIME: MIRO LUKIN   BROJ INDEKSA: 54493-2007

1) $\int (x^2+1)\cos(x^3+3x)dx$ $\emptyset$

2) $y = x^2+3x+1$ i pravca $y=-x+6$



Prc.

x	0	1	-1	-2	-3
y	6	5	7	8	9

Par.

x	0	1	-1	2	-2	3	-3
y	1	5	-1	11	11	19	

Presjecišta:

$$-x+6 = x^2+3x+1$$

$$-x+6-x^2-3x-1=0$$

$$-x^2-4x+5=0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x_{1,2} = \frac{4 \pm \sqrt{(-4)^2-4\cdot 1\cdot 5}}{2\cdot 1}$$

$$x_{1,2} = \frac{4 \pm \sqrt{16-20}}{2}$$

$$x_{1,2} = \frac{4 \pm -4}{2}$$

$$x_1 = 0$$

$$x_2 = 4$$

$\emptyset$

$$\int_0^4 -x+6dx - \int_0^4 x^2+3x+1dx$$

$$6\int_0^4 -x dx - 3\int_0^4 x^2+x\, dx$$

$$\left. 6\cdot\left(-\frac{x^2}{2}\right) - 3\cdot\frac{x^3}{3} + \frac{x^2}{2} \right|_0^4 \quad P_1 = 0$$

$$P_2 = 6\cdot(-8) - \cancel{3}\cdot\frac{64}{\cancel{3}} + 8$$

$$P = P_2 - P_1$$

$$P = 104$$

$$-48 - 64 + 8$$

$$P_2 = -104$$

POVRŠINA NE MOŽE BITI NEGATIVNA!

Popuniti odmah!

Ime i prezime: ANĐELA SMOLIĆ **Broj indeksa:** 57283

Datum: Vrijeme: od do

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

Broj ↓ bodova

1. Riješiti: $\int (x^2+1)\cos(x^3+3x)\,\mathrm{d}x$ — 10
2. Odrediti površinu između parabole $y = x^2+3x+1$ i pravca $y = -x+6$. — 15
3. Odrediti Taylorov razvoj funkcije $f(x) = x^3+3x-4$ oko točke $x_0 = 1$. — 15
4. Ispitati ekstreme funkcije $f(x,y) = x^2+y^2-xy-2y+1$. $= 2x - x = 0$ — 20
   $2y - 2y = 0$
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,\mathrm{d}x$. — 20
6. Riješiti: $y''+4y'-5y = \cos x$. — 20

0

5. $\int \frac{x^3+1}{x^3+x}dx = x^3+1 : x^3+x = 11$?

$$\begin{array}{r} x^3+x \\ \hline x \\ x \\ \hline 0 \end{array}$$

$\int 11\,dx = 11\int dx = 11x + C$ ×

6. $y''+4y'-5y = \cos x$

nehomogena je ! jer nije $y''+4y'-5y=0$

$\lambda^2 = y''$

$\lambda = 4y$

$y = -5$

$x_{1,2} = \frac{-b\pm\sqrt{b^2-4ac}}{2a} = \frac{-4\pm\sqrt{4^2-4\cdot1\cdot(-5)}}{2\cdot1} = \frac{-4\pm\sqrt{16+20}}{2} = \frac{-4\pm\sqrt{36}}{2}$

$x_{1,2} = \frac{-4\pm6}{2}$

$x_1 = \frac{-4-6}{2} = -\frac{10}{2} = -5$

$x_2 = \frac{-4+6}{2} = \frac{2}{2} = 1$

$y^2+4y-5y = \cos x$

$$\begin{bmatrix} t = \cos x \\ dt = \sin dx \\ dx = \frac{dt}{\sin} \end{bmatrix}$$

? 0

$y^2+4y-5y = t$

$2y+4-5y = t$

0

IME I PREZIME: ANĐELA SMOLIĆ BROJ INDEKSA: 5728

1. $\int (x^2+1)\cos(x^3+3x)\,dx$

$$= \begin{bmatrix} t = x^3 + dx \\ dt = 3x^2 + 3\,dx \\ dx = \dfrac{dt}{3(x^2+1)} \end{bmatrix}$$

?

$$\int \cancel{(x^2+1)} \cos t \frac{dt}{3\cancel{(x^2+1)}} = \frac{1}{3}\int \cos t\,dt$$

$$\frac{1}{3}\sin t + C = \frac{1}{3}\sin x^3 + 3x$$? X

?

IME I PREZIME: ANĐELA SMOLIĆ BROJ INDEKSA: 5728

(3) $f(x) = x^3 + 3x - 4$

točka $(x_0 = 1)$

$f'(x) = x^3 + 3x - 4 = 3x^2 + 3$ $f'(0) = 3 \cdot (0)^2 + 3 = 3$

$f''(x) = 3x^2 + 3 = 3 \cdot 2x + 3 = 6x$ $f'(0) = 0$

$f'''(x) = 6x + 3 = 6$ ✗ $f'(0) = 0$

$$f(x) = \sum_{n=0}^{\infty} \frac{f^n x_0}{n!} (x - x_0)^n$$

$$f(x) = 1 \cdot \frac{3}{1!} \cdot (x-1)^{?} + \frac{0}{2!} (x-1)^{?} +$$

✗ Ø

$$\frac{0}{3!} (x-1) \quad \ldots$$

IME I PREZIME: ANĐELA SMOLIĆ BROJ INDEKSA: 57283

(2)

$y = x^2 + 3x + 1$

$y = -x + 6$

$x^2 + 3x + 1 = -x + 6$

$x^2 + 3x + x + 1 - 6 = 0$

$x^2 + 4x - 5 = 0$

$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-4 \pm \sqrt{4^2 - 4 \cdot 1 \cdot (-5)}}{2 \cdot 1} = \frac{-4 \pm \sqrt{16 + 20}}{2} = \frac{-4 \pm \sqrt{36}}{2}$

$= \frac{-4 \pm 6}{2}$

$x_1 = \frac{-4-6}{2} = \frac{-10}{2} = -5$ ✓

$x_2 = \frac{-4+6}{2} = \frac{2}{2} = 1$ ✓

$P = \int_1^{-5} x^2 + 3x + 1 + \int_1^{-5} -x + 6 =$ ✗ $\not{\bigcirc}$

$P = \int_1^{-5} x^2 dx + 3\int_1^{-5} x\, dx + \int_1^{-5} dx - \int_1^{-5} x dx + 6\int_1^{-5} dx$

$P = \frac{x^3}{3} \Big|_1^{-5} + 3 \cdot \frac{x^2}{2} \Big|_1^{-5} + 1\Big|_1^{-5} - \frac{x^2}{2} \Big|_1^{-5} + 6 \Big|_1^{-5}$

$P = \frac{(-5)^3}{3} - 1^3 + 3 \cdot \frac{(-5)^2}{2} - 3 \cdot \frac{1^2}{2} + 1 \cdot (-5) - 1 \cdot (1)$

$- \frac{(-5)^2}{2} - \frac{1^2}{2} + 6 \cdot (-5) - (6 \cdot 1) =$

$3:2 = 1{,}5$
10

$= -40.6 - 187 - \frac{3}{2} + 4 - 2 - \frac{1}{2} + 24$

$= -203.6$

IME I PREZIME: ANDELA SMOLIĆ   BROJ INDEKSA: 57283

(4) $f(x,y) = x^2 + y^2 - xy - 2y + 1$

$f'(x,y) = 2x - y$

$f(x,y) = 2y - x - 2$

$2x - y = 0 \quad / \cdot 2$

$2y - x = 2$

$-y = -2x$

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

?

Ø

$-y + 4x = 0$

$y - x = 2$

$3x = 2$

$x = \frac{2}{3}$

$A\left(\frac{2}{3}, \frac{4}{3}\right)$

MIN, MAX ?

Popuniti odmah!

IME I PREZIME: MARIN MARAŠ BROJ INDEKSA: 57651

DATUM: VRIJEME: OD DO

∅

MATEMATIKA 2: Trajanje 120 minuta. Ispit se održava sukladno objavljenim pravilima. Na snazi je Pravilnik o stegovnoj odgovornosti studenata.

	Broj ↓ bodova
1. Riješiti: $\int (x^2+1)\cos(x^3+3x)\,dx$	10
2. Odrediti površinu između parabole $y = x^2+3x+1$ i pravca $y=-x+6$.	~~15~~ ∅
3. Odrediti Taylorov razvoj funkcije $f(x) = x^3+3x-4$ oko točke $x_0 = 1$.	~~15~~ ∅
4. Ispitati ekstreme funkcije $f(x,y) = x^2+y^2-xy-2y+1$.	~~20~~ ∅
5. Riješiti: $\int \frac{x^3+1}{x^3+x}\,dx$.	20
6. Riješiti: $y''+4y'-5y = \cos x$.	20

Ime i prezime: MARIN MARAŠ **Broj indeksa:** 57651

3. $f(x) = x^3 + 3x - 4$ $x_0 = 1$

$x - 1 = 0$

1. $f(x) = x^3 + 3x - 4$
2. $f'(x) = 3x^2 + 3$
3. $f''(x) = 6x$
4. $f'''(x) = 6$

1. $f(1) = 0$
2. $f'(1) = 6$
3. $f''(1) = 6$
4. $f'''(1) = 6$

$$f(x) = f(x_0) + \frac{f'(x_0)}{1!}(x-1)^1 + \frac{f''(x_0)}{2!}(x-1)^2 + \frac{f'''(x_0)}{3!}(x-1)^3 \ldots$$

$$f(x) = 0 + \frac{6}{1!}(1-1)^1 + \frac{6}{2!}(1-1)^2 + \frac{6}{3!}(1-1)^3 \ldots$$

$\cancel{0}$

$$x^3 + 3x - 4 = 6(x-1) + 3(x-1)^2 + (x-1)^3$$

IME I PREZIME: MARIN MARAŠ   BROJ INDEKSA: 57651

4. $f(x,y) = x^2 + y^2 - xy - 2y + 1$

$Z_x = 2x - y$

$Z_y = 2y - x - 2$

$2x - y = 0 \quad / \cdot 2$

$2y - x - 2 = 0$

$-2y - 2x = 0$

$2y - x - 2 = 0$

$-3x = 2 \quad / : -3$

$x = -\frac{2}{3}$

$2 \cdot \left(-\frac{2}{3}\right) - y = 0$

$-\frac{4}{3} - y = 0$

$-y = \frac{4}{3}$

$y = -\frac{4}{3}$

$Z_{xx} = 2 \quad A$

$Z_{xy} = -1 \quad B$

$Z_{yy} = 2 \quad C$

$\Delta = AC - B^2$

$\Delta = 2 \cdot 2 - (-1)^2 = 3$

$\Delta = 4 > 0$ max

$T\left(-\frac{2}{3}, -\frac{4}{3}\right)$

$\varnothing$

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

$f\left(-\frac{2}{3}, -\frac{4}{3}\right) = 5$

1) $\int (x^2+1)\cos(x^3+3x)\,dx$

$\varnothing$

IME I PREZIME: MARIN MARAŠ BROJ INDEKSA: 57651

2\. $x^2 + 3x + 1 = -x + 6$

$x^2 + 3x + 1 + x - 6 = 0$

$x^2 + 4x - 5 = 0$

$= \dfrac{-b^2 \pm \sqrt{4ac - b^2}}{2a}$?

$= \dfrac{-4 \pm \sqrt{4 \cdot 1 \cdot 4 - 4^2}}{2}$ ✓ ✗

$= \dfrac{-4 \pm 0}{2}$

$x_1 = \dfrac{-4-0}{2} = -2$

$x_2 = \dfrac{-4+0}{2} = -2$

$P = \int_{-2}^{2} (x^2 + 3x + 1) + \int_{-2}^{2} (-x + 6)$? ? ✗

$P = \left(\dfrac{x^3}{3} + 3\dfrac{x^2}{3}\right)\Bigg|_{-2}^{2} + \left(-\dfrac{x^2}{2}\right)\Bigg|_{-2}^{2}$

$P = 12.33$

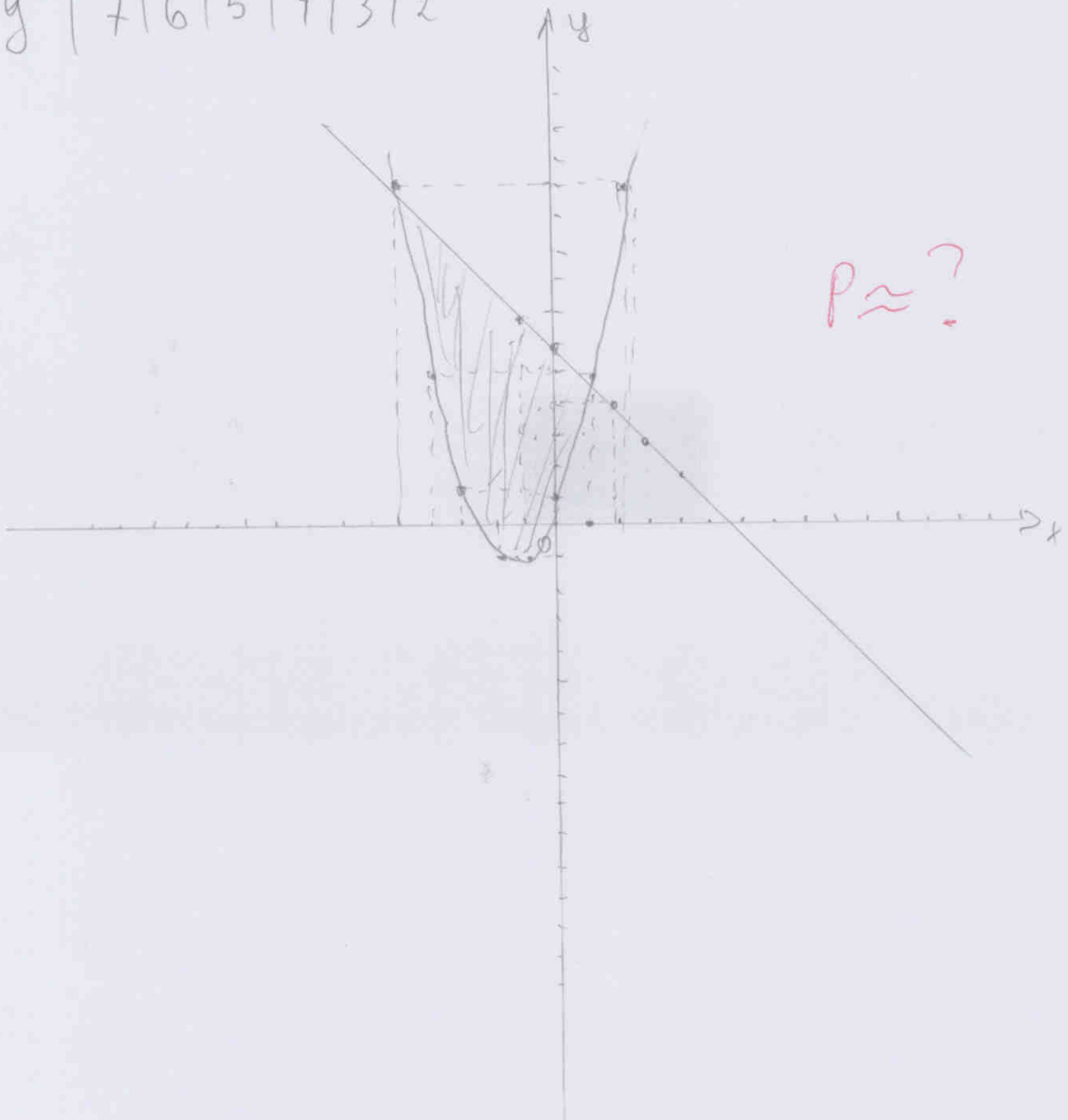
$\emptyset$

Ime i prezime: MARIN MARAŠ **Broj indeksa:** 57651

2. $y = x^2 + 3x + 1$ $y = -x + 6$

x	-6	-5	-4	-3	-2	-1	0	1	2	3	4
y	19	11	5	1	-1	-1	1	5	11	19	29

x	-1	0	1	2	3	4
y	7	6	5	4	3	2



$P \approx ?$