Differensial tenglamalar fanidan TEST savollari

1	1	1	$\begin{cases} y' = 4x^3 \\ y(0) = 1 \end{cases}$ Koshi masalasining yechimini ko`rsating.	$y = x^4 + 1$	$y = x^4$	$y = x^2 + 1$	$y = x^4 - 1$
1	1	2	$y' = \dfrac{1}{2\sqrt{1-x}}$ tenglamaning umumiy yechimini ko`rsating.	$y = -\sqrt{1-x} + C\ (x < 1)$	$y = \sqrt{1-x} + C\ (x \in R)$	$y = 2\sqrt{1-x} + C\ (x \in R)$	$y = 2\sqrt{x-1} + C\ (x > 1)$
1	1	2	$y' = 1 + y^2$ tenglamaning $y(0) = 0$ boshlang'ich shartni qanoatlantiruvchi yechimini toping.	$y = tgx,\ -\dfrac{\pi}{2} < x < \dfrac{\pi}{2}$	$y = \sin x,\ x \in R$	$y = ctgx,\ 0 < x < \pi$	$y = \cos x,\ x \in R$
1	1	2	$x(1-y^2)dx - y(1+x^2)dy = 0$ tenglamaning umumiy yechimini toping.	$(1+x^2)(1-y^2) = C$	$x^2 - y^2 = C$	$x^2 + y^2 = C$	$y = x^2 + C$
1	1	2	$y' = \dfrac{x+y}{x}$ tenglamani yeching.	$y = (\ln\lvert x\rvert + C)x$	$y = e^x + C$	$y = \ln\lvert x\rvert + C$	$y = x + C$
1	1	1	$y' = \cos^2 x$ tenglamaning umumiy yechimini toping.	$y = \dfrac{1}{2}\left(x + \dfrac{1}{2}\sin 2x\right) + C$	$y = \sin 2x + \cos 2x + C$	$y = \sin 2x + C$	$y = tgx + C$
1	1	1	$y' = \dfrac{1}{\sqrt{4-x^2}}$ tenglamani yeching.	$y = \arcsin\dfrac{x}{2} + C$	$y = \arccos x + C$	$y = -\arccos\dfrac{x}{2} + C$	$y = tg2x + C$
1	1	2	Ushbu $y_1 = e^x,\ y_2 = e^{-x}\ (x \in R)$ funksiyalar qaysi tenglamaning bazis yechimlari bo'ladi?	$y'' - y = 0$	$y'' - 2y - 1 = 0$	$y'' + 1 = 0$	$y'' + y' = 0$
1	1	2	Ushbu $y'' - 2y' + y = 0$ tenglamani chiziqli erkli yechimlarini aniqlang.	$y_1 = e^x,\ y_2 = xe^x\ (x \in R)$	$y_1 = \cos x,\ y_2 = \sin x\ (x \in [-\pi, \pi])$	$y_1 = e^x,\ y_2 = e^{-x}\ (x \in R)$	$y_1 = e^{-x},\ y_2 = xe^{-x}\ (x \in R)$
1	1	2	$y = C_1\cos x + C_2\sin x$ funksiya qaysi differensial tenglamaning umumiy yechimi bo'ladi?	$y'' + y = 0$	$y'' - y = 0$	$y'' + 2y = 0$	$y'' + y' = 0$
1	1	2	$y'' + 2y' = 0$ tenglamaning umumiy yechimini toping.	$y = C_1 + C_2e^{-2x}$	$y = C_1 + C_2e^{2x}$	$y = Ce^{-3x}$	$y = C_1e^{2x}$

1	1	2	$y_1 = e^{-x}\cos x,\ y_2 = e^{-x}\sin x$ funksiyalar qaysi tenglamaning bazis yechimlari bo'ladi?	$y'' + 2y' + 2y = 0$	$y'' + y' + y = 0$	$y'' - 2y' - 2 = 0$	$y'' - 4y = 0$
1	1	2	Xarakteristik tenglamasining ildizlari $k_{1;2} = \frac{1}{2} \pm \frac{\sqrt{3}}{2} i$ bo'lgan differensial tenglamani ko'rsating.	$y'' - y' + y = 0$	$y'' + y' - y = 0$	$y'' - y' = 0$	$y'' + 2y = 0$
1	1	2	$y'' = xe^x,\ y(0) = y'(0) = 0$ boshlang`ich masala yechimini toping.	$y = (x-2)e^x + x + 2$	$y = (x-2)e^x$	$y = x + 2$	$y = 2e^x$
1	1	3	$y'' - 4y' + 3y = 0,\ y(0) = 6,\ y'(0) = 10$ Koshi masalasining yechimini toping.	$y = 4e^x + 2e^{3x}$	$y = (x-2)e^x + x + 2$	$y = 4e^x + 2e^{-3x}$	$y = e^{-x} + e^{-3x}$
1	1	3	$y'' + y = 1$ tenglamani yeching.	$y = C_1\cos x + C_2\sin x + 1$	$y = x\sin x + 1$	$y = \ln\lvert\cos x\rvert$	$y = C_1\cos x + C_2\sin x$
1	1	3	$y'' = 6x + 2,\ y(0) = y'(0) = 0$ masala yechimini aniqlang.	$y = x^3 + x^2$	$y = x^3 + x^2 + x + 1$	$y = x^3 + 2x^2$	$y = x^3 + x^2$
1	1	2	$y' + 1 = y$ tenglamaning umumiy yechimini toping.	$y = 1 + Ce^x$	$y = 1 - Ce^x$	$y = Ce^{-x}$	$y = Ce^x$
1	1	3	$y = 5\sin(3t + \varphi_0),\ \left(y = y(t),\ y' = \frac{dy}{dt}\right)$ funksiya qaysi differensial tenglamaning yechimi?	$y'' = -9y$	$y'' = 5y$	$y'' = -5y$	$y'' = 3y$
1	1	2	Quyidagi differensial tenglamalarning qaysi birlari 1-tartibli ozgaruvchilariga nisbatan bir jinsli differensial tenglama?	1,3	1,4	2,3	2,4

			1) $y' = \frac{x^2+xy}{x^2-y^2}$; 2) $y' = \frac{x^2 y}{x^4-y^4}$; 3) $(x^2+y^2-xy)dx + (x^2-y^2)dy = 0$; 4) $y' = \sin\frac{y}{x} + x$				
1	2	3	Moddiy nuqta $a(t) = 8\frac{m}{\min^2}$ o'zgarmas tezlanish bilan to'g'ri chiziqli harakat qilmoqda. Agar u 2 minutda $50m$ masofa o'tgan va $30\frac{m}{\min}$ tezlikka erishgan bo'lsa, nuqtaning harakat tenglamasini aniqlang (vaqt boshi $t=0$).	$x(t) = 4t^2 + 14t + 6$	$x(t) = 4t^2 + 14t$	$x(t) = 4t^2$	$x(t) = 4t^2 + 6$
2	2	3	$y(x) = \int_0^x y(t)dt + x + 1$ tenglamani yeching.	$y = 2e^x - 1$	$y = 2e^x$	$y = e^x + 3$	$y = e^x$
2	2	2	Quyidagi differensial tenglamalarning qaysilari to`liq differensialli? 1) $2xydx + (x^2-y^2)dy = 0$; 2) $2xdx + (x-y)dy = 0$; 3) $y' + a(x) = 0$; 4) $xy' + y = 0$	1,3,4	Hammasi	2,3	1,3
2	2	3	$y' = \sqrt{x+2y} - x$ tenglama yechimlarining yagonalik sohasini toping.	$x > -2y$	$x = -2y$	$y + 2x > 0$	$-2y \le x \le 2y$

2	2	3	$f(x,y)=y^2x$ funksiya $D=\{(x,y)\in R^2 \mid x\in[0;1]\wedge y\in[0;1]\}$ sohada Lipshits shartini qanoatlantiradimi? Qanoatlantirsa, eng kichik Lipshits doimiysi $L-?$	Ha, $L=2$	Ha, $L=4$	Yo`q	Ha, $L=6$
2	2	3	$yy''=y'^2-y'^3$ tenglamani qanday almashtirish bilan tartibi pasaytiriladi?	$y'=p(y)$	$t=\varphi(x)$	$y''=p(t)$	$y'=u(x)y$
2	2	3	$yy''=y'^2+18y^2\sqrt{x}$ differensial tenglama (y,y',y'')larga nisbatan bir jinslimi? Qanday almashtirish bilan tartibi pasaytiriladi?	Ha, $y'=u(x)y$	Yo`q	Ha, $y=e^{mx}$	Yo`q, $y'=p(y)$
2	2	3	Quyidagi differensial tenglamalardan qaysilari umumlashgan bir jinsli? 1. $\frac{y^2}{x^2}+y'^2=3xy''+\frac{2yy'}{x}$; 2. $x^2(y'^2-2yy'')=y^2$; 3. $yy'+xyy''-xy'^2=x$; 4. $x^2yy''+y'^2=0$	1,3	1,4	4,1	3,4,1
2	2	3	Quyidagi funksiyalarning qaysilari chiziqli erkli: 1. $\{e^x,e^{2x},e^{3x}\}$; 2. $\{1,\sin^2x,\cos2x\}$; 3. $\{1,x,x^2\}$; 4. $\{2^x,3^x,6^x\}$	1,3,4	Hammasi	2,3,4	1
2	2	2	x, e^x funksiyalar xususiy yechimi bo`lgan chiziqli bir jinsli differensial tenglama qaysi?	$(x-1)y''+y=xy'$	$y''=ye^x$	$y''=y'e^x+xy$	$y'''+x=0$

2	2	2	$y''-2y'-3y=e^{4x}$ tenglamaga mos normal sistema qaysi?	$\begin{pmatrix}\dot{y}_1\\ \dot{y}_2\end{pmatrix}=\begin{pmatrix}0 & 1\\ 3 & 2\end{pmatrix}\begin{pmatrix}y_1\\ y_2\end{pmatrix}+\begin{pmatrix}0\\ e^{4x}\end{pmatrix}$	$\begin{cases}\dot{y}_1=y_2\\ \dot{y}_2=2y_1+3y_2+e^{4x}\end{cases}$	$\begin{pmatrix}\dot{y}_1\\ \dot{y}_2\end{pmatrix}=\begin{pmatrix}1 & 0\\ 2 & 3\end{pmatrix}\begin{pmatrix}y_1\\ y_2\end{pmatrix}$	Normal sistemaga kelmaydi
2	2	2	$\begin{cases}x'=8y-x\\ y'=x+y\end{cases}$ normal sistemani 2-tartibli chiziqli differensial tenglamaga keltiring.	$x''-7x=0$	$x''+x=0$	$y''+x=0$	$y''-10y=21$
2	2	3	$\begin{cases}y'=1+y^2\\ y(0)=0\end{cases}$ Koshi masalasining davomsiz yechimi qaysi oraliqda aniqlangan?	$\left(-\frac{\pi}{2};\frac{\pi}{2}\right)$	$(0;\pi)$	$\left(-\frac{\pi}{2};\frac{\pi}{4}\right)$	$\left(-\frac{\pi}{2};\pi\right)$
2	2	3	$\begin{cases}\dot{x}=2x+y\\ \dot{y}=3x+4y\end{cases}$ chiziqli sistema turg\`unmi?	Yo\`q	$x>y$ bo\`lsa, turg\`un	aniqlab bo\`lmaydi	Ha
2	2	3	$\begin{cases}\dot{x}=x-y+1\\ \dot{y}=y-4x-1\end{cases}$ chiziqli sistema turg\`unmi?	Yo\`q	$x=y$ bo\`lsa, turg\`un	aniqlab bo\`lmaydi	ha
2	2	3	$\begin{cases}\dot{x}=2y-3x\\ \dot{y}=y-2x\end{cases}$ chiziqli sistema turg\`unmi?	Ha	aniqlab bo\`lmaydi	$x=-y$ bo\`lganda turg\`un	Yo\`q
2	2	3	Yechimlar oilasi $x^2+y^2=C$ bo\`lgan differensial tenglamani tuzing.	$x+yy'=0$	$x^2+y^2=y'$	$y'=\frac{x}{y}$	$\frac{dy}{dx}=10$
2	2	1	$xy'-ay=0$ tenglamaning umumiy yechiini toping.	$y=cx^a$	$y=e^{cx}$	$y=0$	$y=x^a$
2	2	2	$\left(x-y\cos\frac{y}{x}\right)dx+x\cos\frac{y}{x}dy=0$ tenglamaning umumiy yechiini toping.	$x=ce^{-\sin\frac{y}{x}}$	$x=y\ln x$	$x=e^y$	$y=c$

2	2	2	$xdy+ydx=e^x(1+x)dx$ tenglamaning (1;1) nuqtadan o`tuvchi integral chizig`i topilsin.	$y=\frac{1-e}{x}+e^x$	$y=\frac{1-e}{x}$	$y=x(1-e)$	$y=e^x$
2	2	2	$xy'+y=y^2\ln x$ tenglamaning (1;2) nuqtadan o`tadigan integral chizig`ini toping.	$y=\frac{1}{\ln x-\frac{1}{2}x+1}$	$y=(\ln x+2)x-1$	$y=\ln\lvert x\rvert-\frac{1}{2}$	$y=\ln\lvert x\rvert-\frac{1}{2}$
2	2	3	$y'=\frac{1}{(x-1)^2}y^2-\frac{x+1}{(x-1)^2}y+\frac{x}{(x-1)^2}$ Rikkati tenglamasining xususiy va umumiy yechimlarini toping.	$y=1,\ y=\frac{2c(1-x^2)-2x+1}{2c(1-x^2)-1}$	$y=0,\ y=\frac{4c(1-x^2)-2x+1}{2c(x^2+1)}$	$y=4,\ y=2c(x^2-1)$	$y=1,\ y=\frac{2(1-x^2)-2x+1}{2c(x^2-1)}$
2	2	2	To`liq differensialli tenglama $(x^2+2xy)dx+(x^2-y^2)dy=0$ ning umumiy yechimini toping.	$x^3+3x^2y-y^3=c$	$x^3+y^3=c$	$3x^2y-y^3=c$	$y=c$
2	2	2	$(x^2+y)dx-xdy=0$ tenglama uchun integrallovchi ko`paytuvchi topilsin.	$\lambda(x)=\frac{1}{x^2}$	$\lambda(x)=\frac{1}{x^2}+1$	$\lambda(y)=\frac{1}{y^2}$	$\lambda(x,y)=\frac{1}{x^2y}$
2	2	3	$y^2y'^2-9=0$ tenglamani yeching. Uning maxsus yechimi bormi?	$(y^2+c)^2-36x^2=0$ maxsus yechimi yo`q.	Ha	$(y^2+c)^2+36=c$	Yo`q
2	2	3	$xy'+\sqrt{1+y'^2}=y$ Klero tenglamasining maxsus yechimini ko`rsating.	Yo`q	$y=x^2$	$y=x^2$	$y=1-x^2$
2	2	3	$y'=P(x)y+Q(x)$ tenglamada $P(x),Q(x)\in C(R)$ bo`lsa, maxsus yechim bormi?	Yo`q	Aniq bitta(maxsus) yechim bor.	Ha	Ha, $y=1$
2	2	3	Aniq ikkita maxsus yechimi bor $9yy'^2-4=0$ tenglamaning maxsus yechimini ko`rsating.	Maxsus yechimi yo`q	$y=0$	$y=1$	$y=\left(\frac{4}{9}x+1\right)^{3/2}$
2	2	3	$y''=xe^x$ ning yechimini toping	$y=xe^x-2e^x+c_2x+c_1$	$y=xe^x+x^3$	$y=xe^x+2e^x+cx^2+cx$	yechim mavjud emas

2	2	3	$y''(e^x+1)+y'=0$ tenglamani yeching.	$y=c_1(x-e^{-x})+c_2$	$y=-c_1e^x+c_2$	$y=c(x-e^x)$	$y=tgx+c_1x$
2	2	3	$y'''=2xy''$ tenglamani yeching.	$y=c_1\left[x\int_0^x e^{t^2}dt-\frac{1}{2}\left(e^{x^2}-1\right)+c_2x+c_3\right]$	$y=e^x$	$y=c_1\left(\int_0^x e^t dt+c_2x+c_3\right)$	integrallanmaydi
2	2	3	$xy''=2yy'-y'$ tenglamaning tartibi bittaga pasaytirilganini toping.	$xy'=y^2+c$	$xy'+y^3=c$	pasaymaydi	$x+y'=c$
2	2	3	$yy''=2xy'^2,\ y(2)=2,\ y'(2)=0{,}5$ masalaning yechimi $x=1$ da qanday qiymatni qabul qiladi?	$y=\sqrt[5]{12}$	$y=0$	$y=24$	$y=\sqrt[5]{4}$
2	2	2	$y''+4y=0$ tenglamaning chiziqli erkli xususiy yechimlarini toping.	$\cos 2x,\ \sin 2x$	$y=ax$	$e^x,\ e^{-x}$	$e^{2x},\ e^x$
2	2	2	$y^{(IV)}+4y=0$ tenglamaning umumiy yechimi qaysi?	$y=e^x(c_1\cos x+c_2\sin x)+e^{-x}(c_3\cos x+c_4\sin x)$	$y=c_1e^x+c_2e^{-2x}+c_3e^{-x}+c_4e^{2x}$	Yo`q	$y=tgx+c_1x+c_2x^3+c_3x^4+\frac{c_4}{x}$
2	2	2	$y''+y=4\sin x$ ning xususiy yechimini toping.	$y=-2x\cos x$	$y=3x\cos x$	$y=\cos 2x$	$y=-4\cos x$
2	2	2	$y''+y=x\sin x$ tenglamaning umumiy yechimini toping.	$y=\left(c_1-\frac{x^2}{4}\right)\cos x+\left(c_2+\frac{x}{4}\right)\sin x$	$y=\left(c_1+\frac{x^2}{4}\right)\sin x$	$y=e^x$	$y=c_1\cos x+\left(c_2+\frac{x}{4}\right)\sin x$
2	2	2	$y'=a(x)y+b(x)$ ning integrallovchi ko`paytuvchisi qaysi? Bu yerda $a(x), b(x)\in C(R)$	$e^{-\int a(x)dx},\ x\in R$	$\int e^{b(x)}dx,\ x\in R$	$\int e^{a(x)}dx,\ x\in R$	$e^{-\int b(x)dx},\ x\in R$
2	2	3	$y^{IV}+4y''+3y=0$ tenglamaning bazis yechilari (fundamental sistemasi) qaysi?	$\cos x,\ \sin x,\ \cos\sqrt{3}x,\ \sin\sqrt{3}x,\ x\in R$	Yo`q	$\cos x,\ \sin x,\ \cos\sqrt{2}x,\ \sin\sqrt{2}x,\ x\in R$	$\cos\sqrt{3}x,\ \sin\sqrt{3}x,\ \cos 3x,\ \sin 3$
3	2	2	Xarakteristik tenglamalasining ildizlari $k_{1,2}=\pm i, k_3=2$ bo`lgan differensial tenglamani ko`rsating.	$y'''-y''+y'-2y=0$	$y'''-2y'+2y=0$	$y'''-2y''=0$	$y'''+10=0$

3	2	2	Xarakteristik tenglamasining ildizlari $k_{1,2}=\pm\sqrt{3}i, k_{3,4}=\pm i$ bo`lgan differensial tenglamani ko`rsating.	$y^{IV}+4y''+3y=0$	$y^{IV}+y=0$	$y^{IV}+3y'''+6y=0$	$y^{V}+3y''+y=0$
3	2	1	$f(x)$ va $g(y)$ funksiyalar uzluksiz bo`lib, $g(y_0)\neq 0$ bo`lsa, $\begin{cases} y'=f(x)\cdot g(y) \\ y(x_0)=y_0 \end{cases}$ masalaning yechimi quyidagi tengliklarning qaysi biri bilan beriladi?	$\int_{y_0}^{y}\frac{dy}{g(y)}=\int_{x_0}^{x}f(x)dx$	$\int_{y_0}^{y}g(y)dy=f(x)$	$y=\int_{x_0}^{x}f(x)dx$	$y=\int_{x_0}^{x}f(x)dx+c$
3	2	1	$y'=\frac{y+\sqrt{x^2-y^2}}{x}$ tenglama mansub bo`lgan sinf va xususiy yechimini aniqlang.	Bir jinsli tenglama $y_1=x,\ y_2=-x$	Bir jinsli tenglama $y_1=x,\ y_2=-3x$	Chiziqli differensial tenglama $y_1=x+1,\ y_2=-x+1$	To`la differensial tenglama $y_1=x,\ y_2=-x$
3	2	1	$y'+a(x)y=0,\ a(x)\in C(R)$ tenglamaning umumiy yechimini toping.	$y=ce^{-\int_0^x a(t)dt}$	$y=2xy+a(x)$	$y=ce^{\int_0^x a(t)dt}$	$y=ce^{\int_0^x a(t)dt}$
3	2	1	$y'+\frac{y}{x}=x$ tenglamaning integrallovchi ko`paytuvchisini toping.	x	$x+1$	$x+y$	$\frac{1}{x}$
3	2	1	Agar $y'=y^2+y=0,\ y(0)=-2$ bo`lsa, $y(1)-?$	$y(1)=\frac{2}{1-2e}$	$y(1)=\frac{3}{1-e}$	$y(1)=\frac{2}{1-e}$	$y(1)=\frac{3}{1-2e}$
3	2	2	$M(x,y)dx+N(x,y)dy=0$ uchun, agar mavjud bo`lsa, $\mu=\mu(x)$ ko`rinishdagi integrallovchini ko`rsating.	$\mu(x)=e^{\int\frac{M'_y-N'_x}{N}dx}$	$\mu(x)=e^{\int\frac{M'_y-N'_x}{M}dx}$	$\mu(x)=e^{\int\frac{N}{M'_y-N'_x}dx}$	$\mu(x)=e^{\int\frac{N'_y-M'_x}{M}dx}$
3	2	1	$M(x,y)dx+N(x,y)dy=0$ uchun, agar mavjud bo`lsa, $\mu=\mu(y)$ ko`rinishdagi integrallovchi ko`paytuvchi qaysi?	$\mu(y)=\mu(y)=e^{-\int\frac{M'_y-N_x}{M}dy}$	$\mu(y)=e^{-\int\frac{M'_y-N_x}{N}dy}$	$\mu(y)=\mu(y)=e^{-\int\frac{M}{M'_y-N'_x}dy}$	$\mu(y)=e^{-\int\frac{M'_y}{M-N'_x}dy}$

3	2	1	$M(x,y)dx+N(x,y)dy=0$ uchun, agar mavjud bo`lsa, $\mu=\mu(z(x,y))$ ko`rinishdagi integrallovchi ko`paytuvchi qaysi?	$\mu(z(x,y))=e^{\int\frac{M'_y-N'_x}{z'_x\cdot N-z'_y\cdot M}dz}$	$\mu(z(x,y))=e^{\int\frac{M'_y-N'_x}{z'_x\cdot M}dz}$	$\mu(z(x,y))=e^{\int\frac{z'_x\cdot N-z'_y\cdot M_x}{N'_x-M'_y}dz}$	$\mu(z(x,y))=e^{\int\frac{M'_y-N'_x}{z'_y\cdot N}dz}$
3	2	3	$y'=f(x)\cdot g(y)$ tenglama $D=\{(x,y)\mid a\le x\le b, c\le y\le d\}$ da f,g funksiyalar qanday shartni bajarganda yechimga ega bo`ladi?	$f(x)\in C([a,b])$, $g(y)\in C([c,d])$	$f(x)\in C([a,b])$, $g(y)$ - ixtiyoriy	$f(x)$, $g(y)$ - ixtiyoriy	$f(x)$ - ixtiyoriy, $g(y)\in C([c,d])$
3	2	3	Agar $y'+p(x)y=0$ tenglamaning $y=u(x)e^{-\int p(x)dx}$ yechimi bo`lsa, $u(x)$ qanday funksiya?	$u(x)=C$	$u(x)=x$	$u(x)=x+C$	$u(x)=x^2$
3	2	3	$\begin{cases} y'=f(x,y) \\ y(x_0)=y_0 \end{cases}$ Koshi masalasida $f(x,y)$ funksiyasi $P=\{(x,y)\mid \lvert x-x_0\rvert\le a, \lvert y-y_0\rvert\le b\}$ da uzluksiz bo`lsa, Koshi masalasi yechimi uchun qaysi javob to`g`ri?	Yechim mavjud, lekin bir nechta bo`lishi mumkin	(x_0,y_0)dan yagona yechim o`tadi	Yechim mavjud emas	Yechim mavjud va yagona
3	2	3	$P=\{(x,y)\mid \lvert x-x_0\rvert\le a, \lvert y-y_0\rvert\le b\}$ da $\begin{cases} y'=f(x,y) \\ y(x_0)=y_0 \end{cases}$ Koshi masalasi berilgan. Agar f - uzluksiz va $\lvert f'_y(x,y)\rvert\le const$ bo`lsa, mavjudlik va yagonalik teoremasining shartlari bajariladimi?	Ha, bajariladi	Yo`q, bajarilmaydi	Bir qismi bajariladi	Bajarilmaydi.
3	2	3	$y''-y'-2y=0,\ y(0)=2,\ y'(+\infty)=0$ masalaning yechimi qaysi?	$y=-2e^{-x}$	$y=e^{-x}+e^{x}$	$y=2e^{-x}+3e^{x}$	$y=2e^{x}$

3	2	3	$\begin{cases} \dot{y} = 2x + z \\ \dot{z} = y \end{cases}, \ y(1) = 1, z(1) = 0$ Koshi masalasi uchun ikkinchi yaqinlashishni ko\`rsating.	$y_2 = \frac{1}{2} - x + \frac{3}{2}x^2, z_2 = \frac{1}{3}(x^3 - 1)$	$y_2 = x + \frac{3}{2}x^2, z_2 = \frac{1}{3}x^3$	$y_2 = \frac{1}{2} - x + \frac{1}{2}x^2, z_2 = x^3 - 1$	$y_2 = \frac{1}{4} - x, \ z_2 = x^2 - 1$
3	2	2	$\ln x^2, \ln 3x$ va 7 funksiyalar chiziqli erklimi ($x > 0$)?	Yo\`q	aniqlab bo\`lmaydi	Ha, $x = 0$ nuqtada	Ha, $x > 0$ da
3	2	2	Quyidagi shartlarning qaysi bajarilganda ushbu $F(x, y, y') = 0, y(x_0) = y_0$, $y'(x_0) = p_0$, $F(x_0, y_0, p_0) = 0$ masala yagona yechimga ega bo\`ladi ($P = \begin{Bmatrix} (x, y, p) \in R^3 \| \ \|x - x_0\| \le a, \\ \|y - y_0\| \le b, \|p - p_0\| \le c \end{Bmatrix}$)?	$F(x, y, p) \in C^1(P)$, $\frac{\partial F}{\partial p} \neq 0$	$F(x, y, p) \in C^1(P)$, $\frac{\partial F}{\partial p} = 0$	$F(x, y, p) \in C^1(P)$, $\frac{\partial F}{\partial x} \neq 0$	$F(x, y, p) \in C^1(P)$, $\frac{\partial F}{\partial y} \neq 0$
3	2	2	Agar differensial tenglamaning maxsus yechimi bo\`lsa, u qaysi sistemadan topiladi $(p = y')$:	$\begin{cases} F(x, y, p) = 0 \\ F_p(x, y, p) = 0 \end{cases}$	$\begin{cases} F(x, y, p) = 0 \\ F'_y(x, y, p) = 0 \end{cases}$	$\begin{cases} F(x, y, p) = 0 \\ F_p(x, y, p) = 1 \end{cases}$	$\begin{cases} F(x, y, p) = 0 \\ F_x(x, y, p) = 0 \end{cases}$
3	2	2	Birinchi tartibli differensial tenglamanining $\Phi(x, y, c) = 0$ yechimlar oilasining o\`ramasi qaysi sistemaning yechimi bo\`ladi?	$\begin{cases} \Phi(x, y, c) = 0 \\ \Phi'_c(x, y, c) = 0 \end{cases}$	$\begin{cases} \Phi(x, y, c) = 0 \\ \Phi'_x(x, y, c) = 0 \end{cases}$	$\begin{cases} \Phi(x, y, c) = 0 \\ \Phi'_x(x, y, c) = 0 \end{cases}$	$\begin{cases} \Phi(x, y, c) = 1 \\ \Phi'_c(x, y, c) = 1 \end{cases}$
3	2	2	Ushbu $\begin{cases} y^{(n)} = f(x, y, y', ..., y^{(n-1)}) \\ y(x_0) = y_0, y'(x_0) = y_0^1, ..., y^{(n-1)}(x_0) = y_0^{n-1} \end{cases}$, bunda $f \in C(D, R) \ (D \subset R^{n+1})$ $(x_0, y_0, ..., y_0^{(n-1)}) \in D$ masala qaysi shartlar bajarilganda yagona yechimga ega?	$f \in C^n(D)$	$f \in C(D)$	$\frac{\partial f}{\partial y^{n-1}} \neq 0$	A) shart kerak emas

3	2	3	$f(x, x_1, x_2)$ funksiya $D \subset R^3$ sohada x_1, x_2 argumentlari bo\`yicha Lipshits shartini qanoatlantirishi uchun qaysi shartlarning bajarilishi yetarli?	$\lvert f'_{x_1} \rvert < +\infty,\ \lvert f'_{x_2} \rvert < +\infty,\ (x, x_1,$	$\lvert f'_{x_1} \rvert > \infty,\ \lvert f'_{x_2} \rvert > \infty,\ (x, x_1, x$	$\lvert f'_{x_1} \rvert < +\infty,\ \lvert f'_{x_2} \rvert > \infty,\ (x,$	$\lvert f'_{x_1} \rvert > \infty,\ \lvert f'_{x_2} \rvert < +\infty,\ (x, x_1$
			$y^{(n)} + a_1(x) y^{(n-1)} + \ldots + a_n(x) y = 0,\ a_i(x) \in C([c;d]),\ c < d$, tenglama uchun qaysi tasdiqlar to\`g\`ri? 1. Yechim mavjud emas. 2. Yechimlar cheksiz ko\`p 3. Ko\`pi bilan n ta yechim mavjud 4. Yechim birato\`la $[c;d]$da aniqlangan 5. n ta chiziqli erkli yechim mavjud.	2,4,5	2	2,4	1,2
3	2	3	Ushbu $y_1 = \begin{cases} (x-1)^4, \text{ agar } 0 < x \le 1 \text{ bo\`lsa} \\ 0, \text{ agar } 1 \le x \le 2 \text{ bo\`lsa} \end{cases}$, $y_2 = \begin{cases} 0, \text{ agar } 0 < x \le 1 \text{ bo\`lsa} \\ (x-1)^4, \text{ agar } 1 \le x \le 2 \text{ bo\`lsa} \end{cases}$ funksiyalarning $W(x)$ Vroskianni uchun quyidagilarning qaysi to\`g\`ri?	$W(1) = 0$	$W(0) = 1$	$W(2) = 3/2$	$W(3/2) = 2$
3	2	1	Quyidagilarning qaysi biri chegaraviy masala?	$\begin{cases} y'' + y' = 1 \\ y(1) = 1 \\ y'(0) = 0 \end{cases}$	$\begin{cases} y'' - y' = 3 \\ y(0) = 0 \\ y'(0) = 0 \end{cases}$	$\begin{cases} y'' - y' - 2y = 0 \\ y(1) = 3 \\ y'(1) = 4 \end{cases}$	$\begin{cases} y'' + y' = 1 \\ y(0) = 1 \\ y'(0) = 0 \end{cases}$
3	2	3	$\begin{cases} a_0(x) y'' + a_1(x) y' + a_2(x) y = f(x) \\ \alpha y'(x_0) + \beta y(x_0) = 0 \\ \gamma y'(x_1) + \delta y(x_1) = 0 \end{cases}, x_0 \le x \le x_1$ chegaraviy masala berilgan. Agar $G(x,s),\ x_0 \le x \le x_1,\ x_0 \le s \le x_1$ - Grin funksiyasi mavjud bo\`lsa, chegaraviy masalaning yechimi qaysi?	$y(x) = \int_{x_0}^{x_1} G(x,s) f(s) ds$	$y(x) = \int_{x_0}^{x_1} G(x,s) \lvert f(s) \rvert ds$	$y(x) = \int_{x_0}^{x_1} G(x,s) f'(s) ds$	$y(x) = \int_{x_0}^{x_1} G(x,s) ds$

3	2	2	Differensial tenglamalarni ko`rsating: 1. $y''(x)+\int_1^x \frac{e^t}{t}dt\cdot y^2(x)=x,\ x>0$ 2. $y''(x)+\int_1^x \frac{e^t}{t}dt\cdot y^2(x-1)=x,\ x>0$ 3. $y'(x)+\int_0^1 y(x-s)e^s ds=1$ 4. $y'(x)+\frac{e^x}{x}y(x)=x,\ x>0$	1,4	1,2	4,	1,2,3
3	2	1	Quyidagilarning qaysi differensial tenglama emas?	$\int_1^x y(s)y'(x-s)dx+y'(x)=1$	$\left(\frac{x-\lvert x\rvert}{2}\right)y''(x)+y^2=1$	$x^2y(x)-\left(\sqrt{1-x^2}-\sqrt[4]{x^2-1}\right)y'(x)=\sqrt{x}$	$y(x)\cdot y'(x)\cdot y''(x)=x^2$
1	2	2	Quyidagi tasdiqlarning qaysilari to`g`ri? 1. Agar $f:R\to R$ uzluksiz funksiya uchun $f(x_0)\neq 0$ bo`lsa, $\begin{cases}x'=f(x)\\ x(t_0)=x_0\end{cases}$ Koshi masalasi $t_0$ nuqtaning yetarli kichik atrofida yagona yechimga ega. 2. Agar $f\in C(R^2)$ bo`lsa, $\begin{cases}x'=f(x,y)\\ x(t_0)=x_0\end{cases}$ Koshi masalasi t_0 nuqtaning yetarli kichik atrofida yagona yechimga ega. 3. Ushbu $y^V+y^{IV}+y'''+y''+y'+y=0,\ (y=y(x))$	1,3	1,2	4,	1,2,3

			differensial tenglama beshta chiziqli erkli yechimga ega. 4. Ushbu $y^{V}+y^{IV}+y'''+y''+y'+y=0,\ (y=y(x))$ differensial tenglama cheksiz ko\`p chiziqli erkli yechimga ega.				
1	2	1	$y'=1+y$ tenglamaning $y(0)=1$ shartni qanoatlantiruvchi yechimining $x=1$ dagi qiymatini toping	$2e-1$	$3e-1$	$4e-1$	$5e-1$
1	2	1	$y''+y=0$ tenglamaning umumiy yechimini toping.	$y=C_1\cos x+C_2\sin x$	$y=C_1\cos x$	$y=C\sin x$	$y=C_1e^{x}+C_2e^{-x}$
1	2	1	$y=C_1+C_2e^{-2x}$ funksiya qaysi tenglamaning umumiy yechimi bo\`ladi?	$y''+2y'=0$	$y''+y'=0$	$y''-2y'=0$	$y''+5y'=0$
1	2	1	$y''+2y'+2y=0$ tenglamaning bazis yechimini toping.	$y_1=e^{-x}\cos x,\ y_2=e^{-x}\sin x$	$y_1=e^{x}\cos x,\ y_2=e^{x}\sin x$	$y_1=\cos x,\ y_2=\sin x$	$y_1=e^{x},\ y_2=e^{-x}$
2	3	2	$\begin{cases}x'=2x+y+z\\ y'=-2x-z\\ z'=2x+y+2z\end{cases}$ tenglamalar sistemasi uchun xarakteristik tenglamaning ildizlaridan tuzilgan to\`plamni ko\`rsating.	$\{1;2\}$	$\{2;3\}$	$\{3;4\}$	$\{4;5\}$
2	3	2	$\begin{cases}x'=4x-y+e^{3t}(t+\sin t)\\ y'=x+2y+te^{3t}\cos t\end{cases}$ tenglamalar sistemasiga mos bir jinsli tenglamalar sistemasini ko\`rsating.	$\begin{cases}x'=4x-y\\ y'=x+2y\end{cases}$	shu tenglamaning o\`zi bo\`ladi.	$\begin{cases}x'=e^{3t}\\ y'=e^{3t}\end{cases}$	$\begin{cases}x'=e^{3t}(t+\sin t)\\ y'=te^{3t}\cos t\end{cases}$
2	3	2	Quyidagi $x=(C_1+C_2t)e^{3t},\ y=(C_1+C_2+C_2t)e^{3t}$	$\begin{cases}x'=2x+y\\ y'=4y-z\end{cases}$	$\begin{cases}x'=x\\ y'=2x+y\end{cases}$	$\begin{cases}x'=2y\\ y'=x+y\end{cases}$	$\begin{cases}x'=1\\ y'=x+3y\end{cases}$

			funksiyalar qaysi differensial tenglamalar sistemasining yechimi bo`ladi?				
2	3	2	Agar tenglama terkibida noma`lum funksiyaning hosilasi qatnashgan bo`lsa, bu tenglamani differensial tenglama deb atash mumkinmi?	Yo`q	Ha	Yo`q, bu tenglama integral tenglama bo`ladi	Ha, agar noma`lum funksiyaning o`zi ham qatnashgan bo`lsa
2	3	2	Quyidagi funksiyalardan qaysi biri $y\frac{\partial z}{\partial x}-x\frac{\partial z}{\partial y}=0$ xususiy hosilasi differensial tenglamaning yechimi bo`la oladi? 1. $z=f\left(x^2+y^2\right),\ f\in C^1(R)$; 2. $z=C_1x+C_2y^2,\ C_1\neq C_2,\ (x;y)\in R^2$; 3. $z=x^2+y^2,\ (x;y)\in R^2$; 4. $z=x^2+1,\ x\in R$	1,3	3,4	1,2,4	4
2	2	3	Ushbu $xy\frac{\partial z}{\partial x}+xz\frac{\partial z}{\partial y}=y^2,\ z\|_{x=1}=1+y^2$ Koshi masalasini yeching.	$xz-y^2-1=0$	$xz^2-y^2-1=0$	$x^2z-y^2-1=0$	$x^2z^2-y^2-1=0$
2	3	2	$\frac{\partial z}{\partial x}-2\frac{\partial z}{\partial y}=0$ tenglamaning yechimlarini toping. 1. $z=(2x-y)^2$; 2. $z=(x+2y)^2$; 3. $z=f\left(2x+y\right),\ f\in C^1\left(R\right)$; 4. $z=2xy$; 5. $z=(2x+y)^2$	3,5	1,3,5	2,4	1,2,4

2	3	2	Ushbu $x + C\sqrt{1+x^2} - y = 0$ chiziqlar oilasi qanoatlantiruvchi differentsial tenglamani tuzing.	$(1+x^2)y' = xy + 1$	$(x+y)^2 y' = 1$	$y'' - xy = y^2$	$y' = 3 + x^2 - y^2$
1	2	1	Qanday ko'rinishdagi differensial tenglamaga o'zgaruvchilari ajraladigan differensial tenglama deyiladi.	$M(x)N(y)dx + P(x)Q(y)dy = 0$	$y' = f(ax + by + c)$	$y' = g\left(\frac{y}{x}\right)$	$y' + p(x)y = q(x)$
2	3	2	Ushbu $y' = f\left(\frac{2x+y-3}{x-y+1}\right)$ tenglamani bir jinsli tenglamaga keltiruvchi almashtirishni ko'rsating.	$x = \xi + 1$ $y = \eta + 2$	$x = \xi + 2$ $y = \eta + 1$	$x = 2\xi + 1$ $y = \eta + 2$	$x = \xi + 1$ $y = 2\eta + 1$
2	3	2	Ushbu $y' = \frac{y}{x} g\left(\frac{y}{x^\alpha}\right)$ tenglamani o'zgaruvchilari ajraladigan tenglamaga keltiruvchi almashtirishni ko'rsating.	$y = x^\alpha u$	$y = x^{\alpha-1}u$	$y = xu$	$y = x^{\alpha+1}u$
2	3	2	Ushbu $y' + p(x)y = q(x)y^m$ $(m \neq 0, m \neq 1)$ tenglamani chiziqli tenglamaga keltiruvchi almashtirishni ko'rsating.	$u = \frac{1}{y^{m-1}}$	$u = \frac{1}{y^m}$	$u = \frac{1}{y^{m+1}}$	$u = \frac{1}{y^{m-2}}$
2	3	2	Ushbu	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$	$\frac{\partial^2 M}{\partial x \partial y} = \frac{\partial^2 N}{\partial x \partial y}$	$\frac{\partial^2 M}{\partial x^2} = \frac{\partial^2 N}{\partial y^2}$

			$M(x,y)dx+N(x,y)dy=0$ $M,N\in C^1(D), D-$ bir bog`lamli s differensial tenglama to'la differensialli tenglama bo'lishi uchun qanday shart bajarilishi kerak?				
2	3	2	Ushbu $y'=\sqrt[3]{y^2}$ differensial tenglamaning maxsus yechimlarini ko'rsating.	$y=0$	$y=-1, y=0$	$y=x$	$x=0, y=0$
2	3	2	Ushbu $y'''=2xy''$ tenglamaning umumiy yechimini toping.	$y=\int_{x_0}^{x} c_1e^{t^2}(x-t)dt+$ $+c_2(x-x_0)+c_3$	$y=\int_{x_0}^{x} e^{t^2}(x-t)dt+$ $+c_1(x-x_0)+c_2$	$y=c_1e^{x^2}+$ $+c_2x+c_3$	$y=\int_{x_0}^{x} c_1e^{t^2}dt+$ $+c_2(x-x_0)+c_3$
2	3	2	Ushbu $y_1(x)=e^x, y_2(x)=x^{-1}$ funktsiyalar qanday eng katta oraliqlarda chiziqli erkli.	$(-\infty;0),(0;+\infty)$	$(-\infty;0),(-1;+\infty)$	$(-1;2),(3;+\infty)$	$(-\infty;0),(1;+\infty)$
2	3	2	Ushbu $y'''-2y''-y'+2y=0$ tenglamaning bazis yechimlarini toping.	e^{-x},e^x,e^{2x}	e^{-2x},e^x,e^{-x}	e^x,e^{3x},e^{-2x}	e^{-5x},e^x,e^{3x}
2	3	2	Ushbu $y''+4y'+4y=\sin 2x$ tenglamaning xususiy yechimini toping.	$y=-\frac{1}{8}\cos 2x$	$y=-\frac{1}{8}\sin 2x$	$y=\frac{1}{4}\cos 2x$	$y=\frac{1}{8}\cos 2x$

2	3	2	Ushbu $\begin{cases} x' = y \\ y' = x \end{cases}$ sistemani yeching.	$\begin{cases} x = c_1e^{-t} + c_2e^t \\ y = -c_1e^{-t} + c_2e^t \end{cases}$	$\begin{cases} x = c_1e^{-2t} + c_2e^t \\ y = -c_1e^{-2t} + c_2e^t \end{cases}$	$\begin{cases} x = c_1e^{-t} + c_2te^t \\ y = c_1e^{-t} + c_2te^t \end{cases}$	$\begin{cases} x = c_1te^{-t} + c_2e^t \\ y = -c_1te^{-t} + c_2e^t \end{cases}$
2	3	2	Ushbu $\begin{cases} x' = y + z \\ y' = x + z \\ z' = x + y \end{cases}$ sistemaning xarakteristik sonlarini toping.	$\lambda_1 = 2, \lambda_2 = -1$	$\lambda_1 = 1, \lambda_2 = -1$	$\lambda_1 = 2, \lambda_2 = 1$	$\lambda_1 = -2, \lambda_2 = 1$
2	3	2	Ushbu $\begin{cases} x' = 2x - y^2 - 1 \\ y' = x - y^2 \end{cases}$ sistemaning muvozanat nuqtalarini toping.	(1;1),(1;-1)	(1;2),(1;-1)	(2;1),(1;-2)	(1;1),(-1;-1)
2	3	2	Ushbu $x^2\frac{\partial u}{\partial x} + y^2\frac{\partial u}{\partial y} + xy\frac{\partial u}{\partial z} = 0$ tenglamaning xarakteristik sistemasini tuzing.	$\frac{dx}{x^2} = \frac{dy}{y^2} = \frac{dz}{xy}$	$\frac{dx}{x} = \frac{dy}{y} = \frac{dz}{xy}$	$\frac{dx}{y^2} = \frac{dy}{x^2} = \frac{dz}{xy}$	$\frac{dx}{2x^2} = \frac{dy}{2y^2} = 2\frac{dz}{xy}$
2	3	2	Ushbu $y' = \frac{y}{x} + g\left(\frac{y}{x}\right)h(x)$ tenglamani oʻzgaruvchilari ajraladigan tenglamaga keltiruvchi almashtirishni koʻrsating.	$y = xu$	$y = x^2u$	$y = \frac{u}{x}$	oʻzgaruvchilari ajraladigan tenglamaga keltiruvchi almashtirish yoʻq.
2	3	2	Ushbu $xy' = y + x^2e^{y/x}$	$y = -x\ln(c - x)$	$y = -x^2\ln(c - x)$	$y = -\ln(c - x)$	$y = -x\ln(c + x)$

			tenglamani yeching.				
2	3	2	Ushbu $$xy' - 2y = 2x^4, (x > 0)$$ tenglamaning xususiy yechimini toping.	$y = x^4$	$y = 2x^4$	$y = \frac{1}{2}x^4$	$y = x^4 + x$
2	3	2	Ushbu $y' = f(ax + by + c), (b \neq 0)$ tenglama $u(x) = ax + by + c$ almashtirish bilan qanday ko‘rinishga keladi.	$u' = a + bf(u)$	$u' = a - bf(u)$	$u' = a + f(u)$	$u' = -a + bf(u)$
2	3	2	Ushbu $$y^{(4)} + 2y^{(2)} + y = 0$$ tenglamaning bazis yechimlarini toping.	$\cos x,\ x\cos x,\ \sin x,$	$\cos 2x, x\cos 2x, \sin 2x, x\sin 2x$	$\cos x, \sin x$	$\cos 3x, x\cos 3x, \sin 3x, x\,\mathrm{si}$
1	2	2	Chrgaraviy masala uchun Grin funksiyasini quring: $y'' = 0, y(0) = 0, y(1) = 0.$	$G(x,\xi) = \begin{cases} (1-\xi)x, & x \le \xi; \\ (1-x)\xi, & x \ge \xi. \end{cases}$	$G(x,\xi) = \begin{cases} \xi x, & x \le \xi; \\ 1-\xi, & x \ge \xi. \end{cases}$	$G(x,\xi) = \begin{cases} x, & x \le \xi; \\ \xi, & x \ge \xi. \end{cases}$	$G(x,\xi) = \begin{cases} (1-x)\xi, & x \le \xi; \\ (1-\xi)x, & x \ge \xi. \end{cases}$
1	2	2	Chrgaraviy masala uchun Grin funksiyasini quring: $y'' = 0, y(0) = 0, y'(1) = 0.$	$G(x,\xi) = \begin{cases} x, & x \le \xi; \\ \xi, & x \ge \xi. \end{cases}$	$G(x,\xi) = \begin{cases} (1-\xi)x, & x \le \xi; \\ (1-x)\xi, & x \ge \xi. \end{cases}$	$G(x,\xi) = \begin{cases} (1-x)\xi, & x \le \xi; \\ (1-\xi)x, & x \ge \xi. \end{cases}$	$G(x,\xi) = \begin{cases} \xi x, & x \le \xi; \\ 1-\xi, & x \ge \xi. \end{cases}$
1	1	3	$y' = \sin xy$ differensial tenglamaning noldan farqli davomsiz yechimi…	birorta nuqtada ham nolga teng emas	monoton o`suvchi	monoton kamayuvchi	chegaralangan oraliqda aniqlangan
1	3	2	Sistemani koordinatalar boshi atrofida chiziqlilashtiring:	$\begin{cases} x' = 2y - x \\ y' = -3y \end{cases}$	$\begin{cases} x' = 2y + x \\ y' = 3y \end{cases}$	$\begin{cases} x' = x + 2y \\ y' = x - y \end{cases}$	$\begin{cases} x' = 1 + \sin(x + 2y) - e^{2x} \\ y' = \cos(x - y) - (1 + y)^3 \end{cases}$

			$\begin{cases} x' = 1+\sin(x+2y)-e^{2x}, \\ y' = \cos(x-y)-(1+y)^3. \end{cases}$				
3	1	2	Sistema muvozanat nuqtasining turini (tipini) aniqlang: $\begin{cases} x' = x+2y \\ y' = -3x+4y \end{cases}$	Noturg\`un fokus	Turg\`un fokus	Noturg\`un tugun	Egar
3	1	2	Sistema muvozanat nuqtasining turini (tipini) aniqlang: $\begin{cases} x' = x+y \\ y' = 2x-4y \end{cases}$	Egar	Noturg\`un tugun	Turg\`un fokus	Markaz
3	1	2	Sistema muvozanat nuqtasining turini (tipini) aniqlang: $\begin{cases} x' = x-3y \\ y' = 2x-4y \end{cases}$	Turg\`un tugun	Noturg\`un tugun	Egar	Turg\`un fokus
3	1	2	Sistema muvozanat nuqtasining turini (tipini) aniqlang: $\begin{cases} x' = -2x+3y \\ y' = x+2y \end{cases}$	Egar	Turg\`un tugun	Markaz	Turg\`un fokus
3	1	2	Sistema muvozanat nuqtasining turini (tipini) aniqlang: $\begin{cases} x' = x-2y \\ y' = 4x-4y \end{cases}$	Turg\`un fokus	Noturg\`un fokus	Egar	Turg\`un tugun
3	1	2	Sistema muvozanat nuqtasining turini (tipini) aniqlang: $\begin{cases} x' = x-2y \\ y' = -x+3y \end{cases}$	Noturg\`un tugun	Egar	Turg\`un tugun	Noturg\`un fokus
2	3	2	$y''-y'-2y=0$ ning umumiy yechimi topilsin	$*y = c_1e^{-x}+c_2e^{2x}$	$y = c_1e^{-x}+c_2e^{-2x}$	$y = c_1e^{x}+c_2e^{-2x}$	$y = c_1e^{x}+c_2e^{2x}$

1	2	2	$y''-5y'+6y=0$ ning umumiy yechimi topilsin	$*y=c_1e^{2x}+c_2e^{3x}$	$y=c_1e^{2x}+c_2e^{-3x}$	$y=c_1e^{-2x}+c_2e^{3x}$	$y=c_1e^{-2x}+c_2e^{-3x}$
1	2	2	$xy^{(4)}-y'''=0$ ning umumiy yechimi topilsin	$*y=c_1x^4+c_2x^2+$ $+c_3x\ +c_4$	$y=c_1x^4+\ +c_3x\ +c_4$	$y=c_2x^2\ +c_3x\ +c_4$	$*y=c_1x^4+c_2x^2+$ $+c_3x$
1	1	3	$xy''-y'^2=0$ ning umumiy yechimi topilsin	$*y=c_2e^{c_1x}$	$y=c_1e^{c_1x}$	$y=e^{c_1x}$	$y=c_1e^x$
3	1	2	$xyy''+y'^2-yy'=0$ ning umumiy yechimi topilsin	$*y=c_1\sqrt{x^2+c_2}$	$y=\sqrt{x^2+c_2}$	$y=c_1\sqrt{x^2+c_1}$	$y=c_1x$
2	3	2	$e^x, 2e^x, e^{-x}$ ning Vronskiani topilsin	0	1	4	2
1	2	2	$y'''=8\sin 2x$ tenglamani biror xususiy yechimini ko'rsating	$*y=\cos 2x$	$y=-\sin 2x$	$y=-\cos 2x$	$y=\sin x+\cos x$
1	2	2	$y'''=\frac{1}{8}\sin\frac{x}{2}$ tenglamani biror xususiy yechimini ko'rsating	$*y=\cos\frac{x}{2}$	$y=-\sin\frac{x}{2}$	$y=-\cos x$	$y=\sin x+\cos x$
1	1	3	$y''-y'-2y=0$ ning umumiy yechimi topilsin	$*y=c_1e^{-x}+c_2e^{2x}$	$y=c_1e^{-x}+c_2e^{-2x}$	$y=c_1e^{x}+c_2e^{-2x}$	$y=c_1e^{x}+c_2e^{2x}$
1	3	2	$y''-5y'+6y=0$ ning umumiy yechimi topilsin	$*y=c_1e^{2x}+c_2e^{3x}$	$y=c_1e^{2x}+c_2e^{-3x}$	$y=c_1e^{-2x}+c_2e^{3x}$	$y=c_1e^{-2x}+c_2e^{-3x}$
3	1	2	$xy^{(4)}-y'''=0$ ning umumiy yechimi topilsin	$*y=c_1x^4+c_2x^2+$ $+c_3x\ +c_4$	$y=c_1x^4+\ +c_3x\ +c_4$	$y=c_2x^2\ +c_3x\ +c_4$	$*y=c_1x^4+c_2x^2+$ $+c_3x$
1	2	3	Ushbu $(x^2+y)dx-xdy=0$ tenglamaning integrallovchi ko'paytuvchisini ko'rsating.	$\mu(x)=\frac{1}{x^2}$	$\mu(x)=-\frac{1}{x^2}-x$	$\mu(y)=\frac{1}{y^2}$	$\mu(x)=x^2$
1	2	3	$y-4y''=-3e^{-x}$ tenglamaning umumiy yechimini toping	$y=c_1e^{0.5x}+c_2e^{-0.5x}-e^{-x}$	$y=c_1e^{3x}+c_2e^{-3x}+e^{x}$	$y=c_1\cos x+c_2\sin x+e^{x}$	$y=c_1+c_2e^{-x}-e^{x}$

1	2	3	Sistemani yeching: $\begin{cases} \dot{x}(t) = 2x + y \\ \dot{y}(t) = 3x + 4y \end{cases}$	$x(t) = c_1e^t + c_2e^{5t}$ $y(t) = -c_1e^t + 3c_2e^{5t}$	$x(t) = c_1e^{2t} + c_2e^t$ $y(t) = -c_1e^{-t} + 3c_2e^{5t}$	$x(t) = -c_1e^t + c_2e^{5t}$ $y(t) = -c_1e^t + 3c_2e^{5t}$	$x(t) = -c_1e^t - c_2e^{2t}$ $y(t) = -c_1e^t + 3c_2e^{5t}$
1	2	3	$dy = \ln(2x + y - 2)dx$ tenglama qanday almashtirish yordamida o'zgaruvchilari ajralgan tenglamaga keladi?	$z = 2x + y - 2$	$y = zx^n$	$y = zx$	$y = 3e^{2x}$
1	2	3	Birinchi tartibli chiziqli tenglamani aniqlang:	$xy' + \sin x \cdot y = \cos x$	$dy = \sin(ax + by)dx$	$\sin x \cdot ydx + yxdy = 0$	$mxdx + nydy = 0$
1	2	3	Ushbu $y' + 2xy = e^{-x^2} \sin x$ tenglamaning integrallovchi ko'paytuvchisini ko'rsating	$\mu(x) = e^{x^2}$	$\mu(x) = -\frac{1}{x^2}$	$\mu(y) = \frac{1}{y^2}$	$\mu(x) = x^2$
1	2	3	$y''^2 + y'y + xy'y'' = 0$ tenglama tartibi … almashtirish orqali bittaga kamaytiriladi	$y' = zy$	$y' = zx$	$y' = z$	$y' = ze^x$
1	2	2	$y' = f\left(\frac{x - y + 1}{2x - 2y - 3}\right)$ tengla-ma qanday almashtirish yordamida o'zgaruvchilari ajralgan tenglamaga keladi?	$z = x - y$	$z = yx^2$	$z = yx$	$z = ye^{ax}$
1	2	2	$yy'' + xy'^2 = 0$ tenglama tartibi … almashtirish orqali bittaga kamaytiriladi	$y' = zy$	$y' = zx$	$y' = z$	$y' = ze^x$
1	2	2	Ushbu $2xy^2dx - (1 + 3x^2y)dy = 0$ tenglamaning integral-lovchi ko'paytuvchisini ko'rsating	$\mu = \varphi(y)$	$\mu = \varphi(x)$	$\mu = \varphi(xy)$	$\mu = \varphi(x + y)$

1	2	2	$y''^2 + yy' + y'y'' = 0$ tenglama tartibi … almashtirish orqali bittaga kamaytiriladi	$y' = zy$	$y' = ze^x$	$y' = zx$	$y' = z$
1	2	2	Ushbu $\left(x^2 + xy^2\right)dx - 2x^2 ydy = 0$ tenglamaning integrallov-chi ko'paytuvchisini ko'rsating	$\mu = \varphi(x)$	$\mu = \varphi(xy)$	$\mu = \varphi(x + y)$	$\mu = \varphi(x - y)$
1	2	3	Ushbu $\left(x^2 + xy\right)dx - x^2 dy = 0$ tenglamaning integrallov-chi ko'paytuvchisini ko'rsating	$\mu(x) = \frac{1}{x^3}$	$\mu(x) = -\frac{1}{x^2}$	$\mu(y) = \frac{1}{y^2}$	$\mu(x) = x^2$
1	2	2	Ushbu $(\ln x + xy)dx + x^2 dy = 0$ tenglamaning integrallov-chi ko'paytuvchisini ko'rsating	$\mu(x) = \frac{1}{x}$	$\mu(x) = -\frac{1}{x^2}$	$\mu(y) = \frac{1}{y^2}$	$\mu(x) = x^2$
1	2	2	Agar $y_1(x)$ va $y_2(x)$ biror bir jinsli bo'lmagan chiziqli differensial tenglama yechimi bo'lsa, u holda … funksiya mos birjinsli tenglama xususiy yechimi bo'ladi	$y_1(x) - y_2(x)$	$y_1(x) \cdot y_2(x)$	$y_1(x) + y_2(x)$	$\sqrt{y_1(x) y_2(x)}$
1	2	1	$y' = \frac{3x - y}{2x + y}$ tenglama qanday almashtirish yordamida o'zgaruvchilari ajralgan tenglamaga keladi?	$z = \frac{y}{x}$	$y = zx^n$	$y' = zy$	$y = \frac{z}{x}$
1	2	1	$y' - 2xy = 1 - 2x$ tenglamaning umumiy yechimini toping	$y = c \cdot e^{x^2} + x$	$y = c + e^{x^2/2}$	$y = c \cdot e^{2x^2} + x$	$y = c \cdot x^2$
1	2	1	$y'' - 6y' = -5e^x$ tenglamaning umumiy yechimini toping	$y = c_1 + c_2 e^{6x} + e^x$	$y = c_1 \cos 6x + c_2 \sin 6x$	$y = ce^{-6x} + e^x$	$y = e^{-6x}\left(c_1 \cos x + c_2 \sin x\right)$
1	2	1	$3y - xy' = 2x$ tenglamaning umumiy yechimini toping	$y = cx^3 + x$	$y^3 = cx + x^2$	$xy + y^3 = c$	$y = 0$

1	2	1	Ushbu $2y = xy' + \sqrt{\sin y'}$ tenglama ... tenglamasi deb bo'ladi.	Lagranj	Bernulli	Klero	Rikkati
1	2	2	Qanday almashtirish bajarilsa ushbu $y' - x^2 y = x\sqrt[3]{y^2}$ tenglama chiziqli tenglamaga keladi?	$z = \sqrt[3]{y}$	$y = zx$	$z = \frac{1}{\sqrt{y}}$	$y = zx^2$
1	2	1	Eyler tenglamasi qaysi javobda ko'rsatilgan?	$(x-0.5)y'' - \frac{3y}{2x-1} = 0$	$xy'' - 2y' - 3xy = 0$	$xy' - x^2 y + 1 = 0$	$y'' + 2y' + y = 0$
1	2	1	$y''' - 2y'' = 0$ tenglamaning umumiy yechimini toping	$y = c_1 + c_2 x + c_3 e^{2x}$	$y = ce^{2x}$	$y = c_1 e^{2x} + c_2 e^{-2x}$	$y = ce^{-6x}\sin 6x$
1	2	3	Berilgan differensial tenglamaning yeching: $y'' - 4y' + 4y = e^x$	$y = c_1 e^{2x} + c_2 x e^{2x} + e^x$	$y = c_1 e^{2x} + c_2 e^{2x} + 1$	$y = c_1 e^{-x} + c_2 x e^{x} + 1$	$y = bx + c$
1	2	3	Hususiy yechimi $y_1 = x\,e^{2x}$ bo'lgan chiziqli o'zgarmas koeffisientli differensial tenglamani ko'rsating.	$y'' - 4y' + 4y = 0$	$y''' - y' = 0$	$y'' - y = 0$	$y''' + 3y' = 0$
1	2	3	$y''' = x$ tenglamani yeching	$y = \frac{x^4}{24} + \frac{c_1}{2}x^2 + +c_2 x + c_3$	$y = \frac{x^4}{24} + \frac{c_1}{2}x^2$	$y = \frac{c_1}{2}x^2 + c_2 x$	$y = \frac{x^4}{24}$
1	2	3	$2xy'' = y'$ ning umumiy yechimi topilsin	$*y = c_1 x^{\frac{3}{2}} + c_2$	$y = -c_1 x^3$	$y = -c_1 \cos x + c_2$	$y = c$
1	2	3	Ushbu $(x^2 + y)dx - xdy = 0$ tenglamaning integrallovchi ko'paytuvchisini ko'rsating.	$\mu(x) = \frac{1}{x^2}$	$\mu(x) = -\frac{1}{x^2} + x$	$\mu(y) = \frac{1}{y^2}$	$\mu(x) = x^2$
1	2	2	$y - 4y'' = -3e^{-x}$ tenglamaning umumiy yechimini toping	$y = c_1 e^{0.5x} + c_2 e^{-0.5x} - e^{-x}$	$y = c_1 e^{3x} + c_2 e^{-3x} + e^x$	$y = c_1 \cos x + c_2 \sin x + e^x$	$y = c_1 + c_2 e^{-x} - e^x$

1	2	2	Berilgan tenglamaning tipini aniqlang: $\left(x-x^2\right)y'+(x-1)y\ln x=0$	o'zgaruvchilari ajraladigan	to'la differensial	y ga nisbatan chiziqli	Bernulli
1	2	2	Tenglamaning tipini aniqlang $x^2y'=3y^2+x^2e^{\frac{2y}{x}}$	Bir jinsli differensial tenglama	Bernulli	o'zgaruvchilari ajraladigan	to'la differensial
1	2	2	$y'x=\cos x-y$ tenglamani yechimini aniqlang.	$y=\dfrac{\sin x+c}{x}$	$y=\cos x+cx^2$	$y=cx+\sin x$	$y=cx+\cos x$
1	2	3	$\left(3x^2-\sin x\right)dx-2ydy=0$ tenglamaning umumiy yechimini toping	$y^2=x^3+\cos x+c$	$y\sin x+y^3=c$	$y^2\cos x+x^3=c$	$y^2=x^3-\cos x+c$
1	2	3	Tenglamaning tipini aniqlang $y=x\sin^2 y'+y'^2$	Lagranj	Bernulli	Klero	Eyler
1	2	3	Ushbu $y=cx^2$ chiziqlar sinfining differensial tenglamasini toping	$xy'=2y$	$y'=y^{\frac{2}{x}}$	$y'x=3y$	$y'x^2=y^2$
1	2	3	$y'=\dfrac{y}{x\ln x}$ tenglamani yechimini aniqlang.	$y=c\ln x$	$y=c+\ln x$	$y=c\ln x+x$	$y=ce^x$
1	2	3	$y''-2y'=0$ tenglamaning umumiy yechimini toping.	$y=c_1+c_2e^{2x}$	$y=c_1e^{2x}+c_2e^{-2x}$	$y=ce^{-2x}$	$y=c_1\cos 2x+c_2$
1	2	3	$y''+5y'+4y=xe^{-x}$ tenglamaning xususiy yechimi qanday ko'rinishda qidiriladi	$y=\left(ax^2+bx\right)e^{-x}$	$y=x\left(ax^2+bx+c\right)e^x$	$y=x\left(ax+b\right)e^x$	$y=ax^2e^{-x}$
1	2	3	Hususiy yechimi $y_1=xe^{-x}$ bo'lgan chiziqli o'zgarmas koeffisientli differensial tenglamani ko'rsating	$y''+2y'+y=0$	$y''-2y'-3y=0$	$y'-y=0$	$y'''-2y''+y=0$
1	2	3	$2y-y'=e^{-x}$ tenglamaning yechimini toping:	$y=ce^{-2x}+\frac{1}{3}e^{-x}$	$y=ce^{-2x}-\frac{1}{3}e^{x}$	$y=ce^{-x}+2$	$y=ce^{-2x}+\frac{x}{3}e^{x}$

1	2	2	Ushbu $2xydx+\left(x^2+3y^2\right)dy=0$ tenglamaning umumiy yechimini toping:	$x^2y+y^3=c$	$x^2y^2-y=c$	$xy-y^2=c$	$xy^2+y=c$
1	2	2	$y''+2y=0$ tenglamaning umumiy yechimini toping:	$y=c_1\cos\sqrt{2}x+c_2\sin\sqrt{2}x$	$y=c_1e^{\sqrt{2}x}+c_2e^{-\sqrt{2}x}$	$y=c_1\cos 2x+c_2\sin 2x$	$y=c_1+c_2e^{2x}$
1	2	1	$y'''=\cos x$ ning biror yechimi topilsin	$*y=-\sin x$	$y=\sin x$	$y=-\cos 2x$	$y=\cos x$
1	2	2	$xyy''+y'^2-yy'=0$ ning umumiy yechimi topilsin	$*y=c_1\sqrt{x^2+c_2}$	$y=\sqrt{x^2+c_2}$	$y=c_1\sqrt{x^2+c_1}$	$y=c_1x$
1	2	1	$e^x, 2e^x, e^{-x}$ ning Vronskiani topilsin	0	1	4	2
1	2	1	$y'''=8\sin 2x$ tenglamani biror xususiy yechimini ko’rsating	$*y=\cos 2x$	$y=-\sin 2x$	$y=-\cos 2x$	$y=\sin x+\cos x$
1	2	1	$y'''=\frac{1}{8}\sin\frac{x}{2}$ tenglamani biror xususiy yechimini ko’rsating	$*y=\cos\frac{x}{2}$	$y=-\sin\frac{x}{2}$	$y=-\cos x$	$y=\sin x+\cos x$

Izoh:

I.1.Birinchi tartibli tenglamalar
1.2. Yuqori tartibli tenglamalar
1,3. Nochiziqli normal sistemalar
II. Chiziqli normal sistemalar
2.1.Umumiy xossalari
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III. Avtonom sistemalar. Хусусий ҳосилали тенгламалар
3.1. Muvozanat nuqta turlari
3.2. Xususiy hosilali tenglamalar

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