TASDIQLAYMAN
O'quv-uslubiy bo'lim boshlig'i
__________ I.Madatov
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Samarqand davlat universitetning kattaqo'rg'on filiali Aniq va tabiiy fanlar fakulteti 4-bosqich Matematika ta'lim yo'nalishi talabalariga 7-semestr uchun « MATEMATIK FIZIKAGA KIRISH » fanidan yakuniy nazorat savollari

Imtihon shakli: yozma, og'zaki

№	Mavzu	**1-QISM** “NAZARIY SAVOLLAR 1” deb nomalanadi va semestrda o‘qitilishi rejalashtirilgan mavzularning kirish va 1-reja qismidan asosan nazariy savollardan iborat bo’ladi (tayanch iborasi bo’ladi).	**2-QISM** “NAZARIY SAVOLLAR 2” deb nomalanadi va semestrda o‘qitilishi rejalashtirilgan mavzularning 2-rejasidan asosan ++mulohazaviy savollardan iborat bo’ladi (tayanch iborasi bo’ladi).	**3-QISM** “AMALIY SAVOLLAR 1” deb nomalanadi va semestrda o‘qitilishi rejalashtirilgan mavzularning asosan misol, masala kabi savollardan iborat bo’ladi (tayanch iborasi bo’lmaydi).	**4-QISM** “AMALIY SAVOLLAR 2” deb nomalanadi va semestrda o‘qitilishi rejalashtirilgan mavzularning misol hamda masala kabi savollardan iborat bo’ladi (tayanch iborasi bo’lmaydi).	**5-qism** “AMALIY SAVOLLAR 3” deb nomalanadi va semestrda o‘qitilishi rejalashtirilgan mavzularning misol masala savollardan iborat bo’ladi (tayanch iborasi bo’lmaydi).
1.	Oddiy differensial tenglamalar uchun Koshi masalasining mavjudligi va korrektligi (Hosilaga nisbatan yechilgan oddiy differensial tenglamalar uchun Koshi masalasining qo’yilish, yechimning mavjudlik shartlari, yechimning boshlang’ich shartlarga	Oddiy differensial tenglamalar uchun Koshi masalasining mavjudligi	Oddiy differensial tenglamalar uchun Koshi masalasining korrektligi	Tenglama umumiy yechimini toping. $e^x \frac{\partial z}{\partial x} + y^2 \frac{\partial z}{\partial y} = ye^x$	$\begin{cases} U_{tt} = U_{xx} + 5x, \\ U(x,0) = \cos x, \quad U_t(x,0) = 0, \end{cases}$ Tor tebranish tenglamasi uchun qo’yilgan Koshi masalasi yechimini aniqlang	Tenglama umumiy yechimini toping $\frac{\partial^2 u}{\partial x^2} - 2\cos x \frac{\partial^2 u}{\partial x \partial y} - (3+\sin^2 x)\frac{\partial^2 u}{\partial y^2} + \frac{\partial u}{\partial x} + (\sin x - \cos x - 2)\frac{\partial u}{\partial y} = 0$
		Oddiy differensial tenglamalar uchun Koshi masalasiningi yagonaligi	Oddiy differensial tenglamalar uchun Koshi masalasi yechimining boshlang’ich shartlarga bog’liqsizligi	Usbu Koshi masalasini yeching. $u_{tt} = u_{xx} + x\sin t,$ $u(x,t)\big\|_{t=0} = \sin x, \quad u_t(x,t)\big\|_{t=0} = \cos x.$	Tenglamani yeching. $u_{xy} = x + y$	Tenglama umumiy yechimini toping $e^{-2x}\frac{\partial^2 u}{\partial x^2} - e^{-2y}\frac{\partial^2 u}{\partial y^2} - e^{-2x}\frac{\partial u}{\partial x} + e^{-2y}\frac{\partial u}{\partial y} + 8e^y = 0$

	uzluksiz bog’liqligi)					
.	Oddiy differensial tenglamalar uchun chegaraviy masalalar. Grin funksiyasining mavjudligi. (Chegaraviy masala qo’yilishi, Grin funksiyasining mavjudligi) i.	Oddiy differensial tenglamalar uchun chegaraviy masalalar.	Birjinsli chegaraviy masala nol yechimining mavjudligi	Tenglama umumiy yechimini toping. $xy\frac{\partial z}{\partial x} - x^2\frac{\partial z}{\partial y} = yz$	Tenglamani yeching. $u_{xy} = x - y$	Tenglama umumiy yechimini toping $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x\partial y} + y^2\frac{\partial^2 u}{\partial y^2} = 0$
		Oddiy differensial tenglamalar uchun chegaraviy masalaning Grin funksiyasi	Birjinsli bo’lmagan chegaraviy masala Grin funksiyasining mavjudligi (Gilbert teoremasi)	Usbu Koshi masalasini yeching. $u_{tt} = u_{xx} + a\sin bt,$ $u(x,t)\big\|_{t=0} = \cos x, \quad u_t(x,t)\big\|_{t=0} = \sin x.$	Tenglamani yeching. $u_{xy} = x^2 + y$	Tenglama umumiy yechimini toping $\frac{\partial^2 u}{\partial x^2} - 6xy\frac{\partial^2 u}{\partial x\partial y} + 9\frac{\partial^2 u}{\partial y^2} - \frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$
.	Birinchi tartibli xususiy hosilali differensial tenglamalar uchun Koshi masalasi va uni qo’yishda xarakteristikalar ning roli (Birinchi tartibli xususiy hosilali differensial tenglamalar, Koshi masalasi, Xarakteristika)	Xususiy hosilali differensial tenglamalar uchun Koshi masalasi va uni qo’yishda xarakteristikalar ning roli	Birinchi tartibli birjinsli xususiy hosilali differensial tenglamalarning birinchi integrallari	Tenglama umumiy yechimini toping. $(x^2 + y^2)\frac{\partial z}{\partial x} + 2xy\frac{\partial z}{\partial y} = -z^2$	Tenglamani yeching. $u_{xy} = x + y^2$	Tenglamani kanonik shaklga keltiring. $y^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x\partial y} + 2x^2\frac{\partial^2 u}{\partial y^2} + y\frac{\partial u}{\partial y} = 0$
		Xususiy hosilali differensial tenglamalar uchun Koshi masalasini qo’yishda xarakteristikalar ning roli	Birinchi tartibli birjinsli bo’lmagan xususiy hosilali differensial tenglamalarning birinchi integrallari	Usbu Koshi masalasini yeching. $u_{tt} = u_{xx} + axt,$ $u(x,t)\big\|_{t=0} = x, \quad u_t(x,t)\big\|_{t=0} = \sin x.$	Tenglamani umumiy yechimini toping. $x\frac{\partial U}{\partial x} + 2y\frac{\partial U}{\partial y} = 0$	Tenglamani kanonik shaklga keltiring. $tg^2 x\frac{\partial^2 u}{\partial x^2} - 2ytgx\frac{\partial^2 u}{\partial x\partial y} +$ $+y^2\frac{\partial^2 u}{\partial y^2} + tg^3 x\frac{\partial u}{\partial x} = 0$

	Koshi – Kovalevskaya teoremasi.(Birinchi tartibli xususiy hosilali differensial tenglamalar ucun Koshi masalasi, analitik funksiyalar) .	Koshi – Kovalevskaya teoremasi	Birinchi tartibli birjinsli bo’lmagan xususiy hosilali differensial tenglamalar ucun Koshi masalasi	Usbu Koshi masalasini yeching. $z\frac{\partial z}{\partial x}-xy\frac{\partial z}{\partial y}=2xz,\quad x+y=2,\ \ yz=1$	Tenglamani umumiy yechimini toping. $(x^2-1)\frac{\partial U}{\partial x}+\frac{\partial U}{\partial y}=0$	Tenglamani kanonik shaklga keltiring. $\frac{\partial^2 u}{\partial x^2}+2\sin x\frac{\partial^2 u}{\partial x\partial y}-\cos^2 x\frac{\partial^2 u}{\partial y^2}+$ $+\cos x\frac{\partial u}{\partial x}+\frac{1}{2}\sin 2x\frac{\partial u}{\partial y}=0$
		Birinchi tartibli birjinsli xususiy hosilali differensial tenglamalar ucun Koshi masalasi	Oddiy differensial tenglamalar uchun chegaraviy masalaning Grin funksiyas	Usbu Koshi masalasini yeching. $u_{tt}=u_{xx}+bx^2,$ $u(x,t)\big\|_{t=0}=e^{-x},\quad u_t(x,t)\big\|_{t=0}=a.$	Tenglamani umumiy yechimini toping. $-y\frac{\partial U}{\partial x}+x\frac{\partial U}{\partial y}=0.$	Tenglamani kanonik shaklga keltiring. $x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}-3y^2\frac{\partial^2 u}{\partial y^2}-$ $-2x\frac{\partial u}{\partial x}+4y\frac{\partial u}{\partial y}+16x^4u=0$
4.	Ikkinchi tartibli xusus iy hosilali differensial tenglamalar uchun Koshi masalasi (Ikkinchi tartibli xususiy hosilali differensial tenglamalar, Koshi masalasi, Koshi masalasining mavjudlik shartlari, yagonaligi)	Ikkinchi tartibli xususiy hosilali differensial tenglamalar uchun Koshi masalasi	Birinchi tartibli xususiy hosilali differensial tenglamalar va uni yechimini topish	Tenglama umumiy yechimini toping. $xy\frac{\partial z}{\partial x}+(x-2z)\frac{\partial z}{\partial y}=yz$	Tenglamani umumiy yechimini toping. $x^2\frac{\partial U}{\partial x}+2xy\frac{\partial U}{\partial y}=0.$	Tenglamani kanonik shaklga keltiring. $(1+x^2)\frac{\partial^2 u}{\partial x^2}+(1+y^2)\frac{\partial^2 u}{\partial y^2}+$ $+x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}=0$
		Tor tebranish tenglamasi uchun qo‘yilgan Koshi masalasini yechish. Dalamber formulasi	Ikkinchi tarbibli xususiy xosilali giperbolik turdagi tenglamalarning kanonik shaklga keltirish.	Usbu Koshi masalasini yeching. $u_{xx}-6u_{xy}+5u_{yy}=0,$ $u(x,y)\big\|_{y=x}=\sin x,\quad u_y(x,y)\big\|_{y=x}=\cos x.$	Tenglamani umumiy yechimini toping. $y^2\frac{\partial U}{\partial x}+3y\frac{\partial U}{\partial y}=0.$	$\begin{cases}U_{tt}=U_{xx}+b\,x,\\ U(x,0)=x,\quad U_t(x,0)=0,\end{cases}$ Tor tebranish tenglamasi uchun qo’yilgan Koshi masalasi yechimini aniqlang
5.	Ikki o'zgaruvchili Giperbolik tenglamaning umumiy yechimini	Ikkinchi tartibli ikki o’zgaruvchili chiziqli xususiy hosilali differensial	Tor tebranish tenglamasi uchun qo‘yilgan Koshi masalasini yechiminig yagonaligi	Tenglama umumiy yechimini toping. $x^2z\frac{\partial z}{\partial x}+y^2z\frac{\partial z}{\partial y}=x+y$	Tenglamani umumiy yechimini toping. $(2y+1)\frac{\partial U}{\partial x}+x\frac{\partial U}{\partial y}=0.$	$\begin{cases}U_{tt}=U_{xx},\\ U(x,0)=\cos x,\quad U_t(x,0)=2x-4,\end{cases}$ Koshi masalasi yechimini aniqlang

	xarakteristikalar usuli yordamida topish.	tenglamalarni tiplarga ajratish. Xarakteristik tenglama.				
		Ikkinchi tartibli chiziqli xususiy hosilali differensial tenglamalarni kanonik ko'rinishga keltirish(parabolik tip)	Tor tebranish tenglamasi uchun qo'yilgan Koshi masalasi yechiminig turg'unligi	Usbu Koshi masalasini yeching. $3u_{xx}-5u_{xy}+2u_{yy}=0,$ $u(x,y)\big\|_{y=x}=\frac{x}{1+x^2},\quad u_y(x,y)\big\|_{y=x}=\sin x.$	Tenglamani umumiy yechimini toping. $(y+2)\frac{\partial U}{\partial x}+(2x-1)\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}+2\,x, \\ U(x,0)=\sin x, \quad U_t(x,0)=0, \end{cases}$ Koshi masalasi yechimini aniqlang
6.	Riman funksiyasi. Umumiy qo'yilgan Koshi masalasi. (Ikkinchi tartibli xususiy hosilali differensial tenglamalar, Riman funksiyasining mavjudligi)	Riman funksiyasi.	Bir jinsli bo'lmagan to'lqin tenglamasi uchun Koshi masalasininig qo'yilisi va uni yechish.	Tenglama umumiy yechimini toping. $2y^4\frac{\partial z}{\partial x}-xy\frac{\partial z}{\partial y}=x\sqrt{z^2+1}$	. Tenglamani umumiy yechimini toping. $\frac{\partial U}{\partial x}-2y\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}-3, \\ U(x,0)=\cos x, \quad U_t(x,0)=4x, \end{cases}$ Koshi masalasi yechimini aniqlang
		Umumiy qo'yilgan Koshi masalasi.	IIkkinchi tartibli xususiy hosilali differensial tenglamalar uchun Riman funksiyasining mavjudlig	Usbu Koshi masalasini yeching. $u_{xx}+2\cos x u_{xy}-\sin^2 x u_{yy}+u_x+$ $+(1+\cos x-\sin x)u_y=0,$ $u(x,y)\big\|_{y=\sin x}=\cos x,\quad u_y(x,y)\big\|_{y=\sin x}=\sin x.$	Tenglamani umumiy yechimini toping. $(x+2)\frac{\partial U}{\partial x}+(3y+1)\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}-3, \\ U(x,0)=\sin x, \quad U_t(x,0)=7, \end{cases}$ Koshi masalasi yechimini aniqlang
.	Tor tebranish tenglamasi uchun Gursa va Darbu masalalari (Tor tebranish	Tor tebranish tenglamasi uchun Gursa masalalasi	Tor tebranish tenglamasi uchun qo'yilgan Koshi masalasini yechish.	Tenglamani kanonik shaklga keltiring. $5\frac{\partial^2 u}{\partial x^2}+16\frac{\partial^2 u}{\partial x\partial y}+16\frac{\partial^2 u}{\partial y^2}+24\frac{\partial u}{\partial x}+32\frac{\partial u}{\partial y}+64u=0$	Tenglamani umumiy yechimini toping. $2y\frac{\partial U}{\partial x}+\sin x\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}-2, \\ U(x,0)=\cos x, \quad U_t(x,0)=4, \end{cases}$ Koshi masalasi yechimini aniqlang

	tenglamasi, Koshi masalasini qo'yishda xarakteristikalar roli)		Dalamber formulasi			
		Tor tebranish tenglamasi uchun Darbu masalalasi	Parabolikk tipdagi tenglamalar uchun qo'yiladigan masalalar. Korrekt masala tushunchasi	Usbu Koshi masalasini yeching. $\frac{\partial^2 u}{\partial x^2}+2\frac{\partial^2 u}{\partial y \partial x}-\frac{\partial^2 u}{\partial y^2}=0$ $u(x,y)\big\|_{y=0}=3x^2, \quad u_y(x,y)\big\|_{y=0}=0$	Tenglamani umumiy yechimini toping. $xy^2\frac{\partial U}{\partial x}+2023xy\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}+2, \\ U(x,0)=\cos x, \quad U_t(x,0)=3, \end{cases}$ Koshi masalasi yechimini aniqlang
8.	Uch o'lchovli birjinsli to'lqin tenglamasi uchun Koshi masalasi. Puasson formulasi (To'lqin tenglamasi, Fazoda Koshi masalasi, Puasson formulasi)	Uch o'lchovli birjinsli to'lqin tenglamasi uchun Koshi masalasi.	Ikki o'lchovli fazoda Laplas tenglamasining fundamental yechimi	Tenglamani kanonik shaklga keltiring. $\frac{\partial^2 u}{\partial x^2}-2\frac{\partial^2 u}{\partial x \partial y}+\frac{\partial^2 u}{\partial y^2}+3\frac{\partial u}{\partial x}+10\frac{\partial u}{\partial y}=0$	Tenglamani umumiy yechimini toping. $x^2\frac{\partial U}{\partial x}-3y^2\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}+2, \\ U(x,0)=\cos x+2, \\ U_t(x,0)=0, \end{cases}$ Koshi masalasi yechimini aniqlang
		To'lqin tenglamasi, Fazoda Koshi masalasi, Puasson formulasi	Uch o'lchovli fazoda Laplas tenglamasining fundamental yechimi	Tenglama umumiy yechimini toping $x^2\frac{\partial^2 u}{\partial x^2}-2xy\frac{\partial^2 u}{\partial x \partial y}+y^2\frac{\partial^2 u}{\partial y^2}=0$	Tenglamani umumiy yechimini toping. $3y\frac{\partial U}{\partial x}+9x\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=x^2, \quad U_t(x,0)=\cos x, \end{cases}$ Koshi masalasi yechimini aniqlang
9.	Giperbolik tipdagi tenglamalar uchun Koshi va Gursa masalasi. ketma-ket yaqinlashish	Giperbolik tipdagi tenglamalar uchun Koshi va Gursa masalasi.	Qo'shma operator	Tenglamani kanonik shaklga keltiring. $\frac{\partial^2 u}{\partial x^2}+4\frac{\partial^2 u}{\partial x \partial y}+5\frac{\partial^2 u}{\partial y^2}-2\frac{\partial u}{\partial x}-2\frac{\partial u}{\partial y}+u=0$	Tenglamani umumiy yechimini toping. $\frac{\partial U}{\partial x}+ytgx\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=\sin x, \quad U_t(x,0)=5x, \end{cases}$ Koshi masalasi yechimini aniqlang

	usuli.(Qo’shma operator, ketma-ket yaqinlashish)	Giperbolik tipdagi tenglamalar uchun Koshi va Gursa masalasini ketma-ket yaqinlashish usuli.	n o’lchovli fazoda Laplas tenglamasining fundamental yechimi	Tenglama umumiy yechimini toping $\frac{\partial^2 u}{\partial x^2}-2\sin x\frac{\partial^2 u}{\partial x\partial y}-\cos^2 x\frac{\partial^2 u}{\partial y^2}-\cos x\frac{\partial u}{\partial x}=0$ **8.**	Tenglamani umumiy yechimini toping. $x\frac{\partial U}{\partial x}+ye^x\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=\cos x, \quad U_t(x,0)=4x, \end{cases}$ Koshi masalasi yechimini aniqlang
10.	Tor tebranish tenglamasi uchun Koshi masalasini yechishda Fur’ye integralini qo’llash.(Shturm Liuvill masalasi, xos qiymat va xos funksiya, Fur’ye almashtirishlari,)	Tor tebranish tenglamasi uchun Koshi masalasini yechishda Fur’ye integralini qo’llash.	Shturm Liuvill masalasi, xos qiymat va xos funksiya.	Tenglamani kanonik shaklga keltiring. $y^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+2x^2\frac{\partial^2 u}{\partial y^2}+y\frac{\partial u}{\partial y}=0$	Tenglamani umumiy yechimini toping. $-y^2\frac{\partial U}{\partial x}+2x^2y\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=\sin x, \quad U_t(x,0)=3x, \end{cases}$ Koshi masalasi yechimini aniqlang
		Sterjenda issiqlik tarqalish tenglamasi uchun Koshi masalasi yecimining turgunligi.	Fur’ye almashtirishlari	Tenglama umumiy yechimini toping $2\frac{\partial^2 u}{\partial x^2}-5\frac{\partial^2 u}{\partial x\partial y}+3\frac{\partial^2 u}{\partial y^2}=0$	Tenglamani umumiy yechimini toping. $(x^2-1)\frac{\partial U}{\partial x}+(-x+yx)\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=\cos x, \quad U_t(x,0)=\sin x, \end{cases}$
11.	Issiqlik o’tkazuvchanlik tenglamasi uchun qo’yilgan masalalarni Fur’ye almashtirish yordamida yechish (Shturm Liuvill masalasi,	Issiqlik o’tkazuvchanlik tenglamasi uchun qo’yilgan masalalarni Fur’ye almashtirish yordamida yechish (Shturm Liuvill masalasi,	kkinchi tarbibli xususiy xosilali parabolik turdagi tenglamalarning kanonik shaklga keltirish.	Tenglama umumiy yechimini toping $2\frac{\partial^2 u}{\partial x^2}+6\frac{\partial^2 u}{\partial x\partial y}+4\frac{\partial^2 u}{\partial y^2}+\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}=0$	Tenglamani umumiy yechimini toping. $-x\frac{\partial U}{\partial x}+2yx^2\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=x, \quad U_t(x,0)=6x, \end{cases}$ Koshi masalasi yechimini aniqlang

	xos qiymat va xos funksiya, Fur'ye almashtirishlari,)	xos qiymat va xos funksiya, Fur'ye almashtirishlari,)				
		Sterjenda issiqlik tarqalish tenglamasi uchun Koshi masalasi yecimining turgunligi.	Tor tebranish tenglamasi uchun Darbu masalalasi	Tenglama umumiy yechimini toping $3\frac{\partial^2 u}{\partial x^2}-10\frac{\partial^2 u}{\partial x\partial y}+3\frac{\partial^2 u}{\partial y^2}-2\frac{\partial u}{\partial x}+4\frac{\partial u}{\partial y}+\frac{5}{16}u=0$	Tenglamani umumiy yechimini toping. $2023x\frac{\partial U}{\partial x}+10y\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=e^x, \quad U_t(x,0)=-2x+1, \end{cases}$ Koshi masalasi yechimini aniqlang
12.	Issiqlik o'tkazuvchanlik tenglamasi uchun qo'yilgan masalalarni davom ettirish usulida yechish (Issiqlik o'tkazuvchanlik tenglamasi, chegaraviy shartlar, boshlang'ich shartlar, analitik davom ettirish)	Issiqlik o'tkazuvchanlik tenglamasi uchun qo'yilgan masalalarni davom ettirish usulida yechish	Uch o'lchovli fazoda Laplas tenglamasining fundamental yechimi	Tenglama umumiy yechimini toping $e^{-2x}\frac{\partial^2 u}{\partial x^2}-e^{-2y}\frac{\partial^2 u}{\partial y^2}-e^{-2x}\frac{\partial u}{\partial x}+e^{-2y}\frac{\partial u}{\partial y}+8e^{y}=0$	Tenglamani umumiy yechimini toping. $2024x\frac{\partial U}{\partial x}-10y\frac{\partial U}{\partial y}=0.$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=\sin x, \quad U_t(x,0)=x+1, \end{cases}$ Koshi masalasi yechimini aniqlang
		Doira ichkarisida Laplas tenglamasi usun Dirixle masalasi	Sterjenda issiqlik tarqalish tenglamasi uchun qo'yilgan birinchi tur boshlang'ich-chegaraviy masalani yechish.	Tenglama umumiy yechimini toping $\frac{\partial^2 u}{\partial x^2}-6\frac{\partial^2 u}{\partial x\partial y}+8\frac{\partial^2 u}{\partial y^2}+\frac{\partial u}{\partial x}-2\frac{\partial u}{\partial y}+4e^{5x+\frac{3}{2}y}=0$	Tenglamani umumiy yechimini toping. $U_{xx}-9U_{yy}=0$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=\sin x, \quad U_t(x,0)=3x, \end{cases}$ Koshi masalasi yechimini aniqlang
3.	Elliptik tipdagi tenglamalar uchun qo'yilgan chegaraviy masalalarni Grin funksiyasi yordamida yechish (Dirixle	Elliptik tipdagi tenglamalar uchun qo'yilgan chegaraviy masalalarni Grin funksiyasi yordamida yechish	Sterjenda issiqlik tarqalish tenglamasi uchun Koshi masalasi yecimining turgunligi.	Tenglamani kanonik shaklga keltiring. $\frac{\partial^2 u}{\partial x\partial y}+2\frac{\partial^2 u}{\partial y^2}-\frac{\partial u}{\partial x}+4\frac{\partial u}{\partial y}+u=0$	Tenglamani umumiy yechimini toping. $U_{xx}-6U_{xy}+2U_{y}=0$	$\begin{cases} U_{tt}=U_{xx}, \\ U(x,0)=x, \quad U_t(x,0)=0, \end{cases}$ Koshi masalasi yechimini aniqlang

	masalasi, Neyman masalasi,Grin funksiyasi)	Doirada Laplas tenglamasi uchun Dirixle masalasini yechishda Puasson integrali.	Tor tebranish tenglamasi uchun qo'yilgan Koshi masalasi yechimining turg'unligi	Tenglamani kanonik shaklga keltiring. $2\frac{\partial^2 u}{\partial x^2}+2\frac{\partial^2 u}{\partial x\partial y}+\frac{\partial^2 u}{\partial y^2}+4\frac{\partial u}{\partial x}+4\frac{\partial u}{\partial y}+u=0$	Tenglamani umumiy yechimini toping. $U_{xx}+8U_{xy}+3U_x=0$	$\begin{cases}U_{tt}=U_{xx}-2023\,x,\\ U(x,0)=e^x, \quad U_t(x,0)=0,\end{cases}$ Koshi masalasi yechimini aniqlang
14.	Puasson tenglamasi uchun Neyman masalasining Grin funksiyasi (Neyman masalasi,Grin funksiyasi, doira va yarim doirada Grin funksiyasini tuzish)	Doirada Puasson tenglamasi uchun Neyman masalasining Grin funksiyasi yordamida yechish.	Sterjenda issiqlik tarqalish tenglamasi uchun qo'yilgan ikkinchi tur boshlang'ich-chegaraviy masalani yechish	Tenglamani kanonik shaklga keltiring. $\frac{\partial^2 u}{\partial x^2}+2\frac{\partial^2 u}{\partial x\partial y}+\frac{\partial^2 u}{\partial y^2}+3\frac{\partial u}{\partial x}-5\frac{\partial u}{\partial y}+4u=0$	Tenglamani umumiy yechimini toping. $U_{xx}-4U_{yy}+10U_x=0.$	$\begin{cases}U_{tt}=U_{xx}-2\,x,\\ U(x,0)=\sin x, \quad U_t(x,0)=0,\end{cases}$ Koshi masalasi yechimini aniqlang
		Matematik fizikaning Nokorrekt masalalari	Elliptik tipdagi tenglamalar uchun maksimal qiymat prinsipi	Tenglama umumiy yechimini toping $\frac{\partial^2 u}{\partial x^2}-2\cos x\frac{\partial^2 u}{\partial x\partial y}-(3+\sin^2 x)\frac{\partial^2 u}{\partial y^2}+\frac{\partial u}{\partial x}+$ $+(\sin x-\cos x-2)\frac{\partial u}{\partial y}=0$	Tenglamani umumiy yechimini toping. $2U_{xx}-6U_{xy}+4U_{yy}=0.$	$\begin{cases}U_{tt}=U_{xx}-k\,x,\\ U(x,0)=\sin x, \quad U_t(x,0)=0,\end{cases}$ Koshi masalasi yechimini aniqlang