TASDIQLAYMAN
O‘quv-uslubiy bo‘lim boshlig‘i
___________ I.Madatov
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O‘QUV USLUBIY BO‘LIMI

Samarqand davlat universitetning kattaqo‘rg‘on filiali Aniq va tabiiy fanlar fakulteti 1-bosqich Matematika ta’lim yo‘nalishi talabalariga 1-semestr uchun «Algebra » fanidan yakuniy nazorat savollari

Imtihon shakli: yozma og’zaki

№	Mavzu	**1-QISM** “NAZARIY SAVOLLAR 1”	**2-QISM** “NAZARIY SAVOLLAR 2”	**3-QISM** “AMALIY SAVOLLAR 1”	**4-QISM** “AMALIY SAVOLLAR 2”	**5-qism** “AMALIY SAVOLLAR 3”
1.	Kirish. To‘plamlar nazariyasi elementlari. Akslantirishlar va ularning turlari.	To’plam tushunchasi. To’plam ustida bajariladigan amallar.	To`plamlarning birlashmasi, kesishmasi, ayirmasi va simmetrik ayirmasi.	$A=\{1,2,\dots,20\}$ va $B=\{10,11,\dots,30\}$ to’plamlar berilgan bo’lsa ularning birlashmasi, keshishmasi, ayirmasi va simmetrik ayirmasi topilsin.	$A=\{x \mid x\in N, 12<x<32\}$ va $B=\{x \mid x\in N, 7<x<17\}$ to’plamlar berilgan bo’lsa ularning birlashmasi, keshishmasi, ayirmasi va simmetrik ayirmasi topilsin.	Quyidagi ayniyatlarni isbot qiling: $A\setminus(B\cap C)=(A\setminus B)\cup(A\setminus C)$
2.		Akslantirishlar: Syu’rektiv, Inyektiv,	Akslantirishlar: biyektiv, funksional, akslantirish,	Agar f, g X = {1, 2, 3, 4, 5} to’plamning $f=\begin{pmatrix}1&2&3&4&5\\3&1&2&5&4\end{pmatrix}$, $g=$ bo’ladigan akslantirishlari bo’lsa, f^3g^{-2} ni toping.	Agar f, g X = {1, 2, 3, 4, 5} to’plamning $f=\begin{pmatrix}1&2&3&4&5\\5&1&2&3&4\end{pmatrix}$, $\begin{pmatrix}1&2&3&4&5\\3&1&2&5&4\end{pmatrix}$, bo’ladigan akslantirishlari bo’lsa, fg^{-1} ni toping.	Quyidagi ayniyatlarni isbot qiling: $A\cap(B\setminus C)=(A\cap B)\setminus(A\cap C)=(A\cap B)\setminus C$ $g=\begin{pmatrix}1&2&3&4&5\\5&1&2&3&4\end{pmatrix}$
3.	Akslantirishlar ko‘paytmasi, uning assosiativligi.	Akslantirishlar va ularning turlarini tushuntiring	To’plamlarning dekart ko’paytmasini aniqlang va	Agar $f:\boldsymbol{R}\to\boldsymbol{R}$, $f(x)=2x+1$ и $g:\boldsymbol{R}\to\boldsymbol{R}$, $g(x)=3x-1$ bo’lsa gf ni toping.	To`plamning Dekart koordinatalar sistemasidagi geometrik tasvirini toping. $[-1,1]\times[2,3]$	$f(x)=4x$, $g(x)=x^2+2$ bo’lsa $f{\circ}g$ va $g{\circ}f$ larni toping

	To‘plamlarning Dekart ko‘paytmasi. Binar munosabatlar, Ekvivalentlik munosabatlari.		misollar keltiring			
4.		Chekli to’plamlarning dekart ko’paytmasining quvvati qanday aniqlanadi	To’plamlarni sinflarga ajratish	To`plamning Dekart koordinatalar sistemasidagi geometrik tasvirini toping. $[1,3]\times(-\infty,3]$	$f(x)=3x+7, \quad g(x)=x^2$ bo’lsa $f°g$ va $g°f$ larni toping	$f(x)=2x^3+7, \quad g(x)=x^2$ bo’lsa $f°g$ va $g°f$ larni toping
5.	Algebraik amallar. Binar algebraik amallarning xossalari. Asosiy algebraik tuzilmalar (sistemalar): gruppa, halqa va maydonlar. Ta’riflar va misollar.	Binar algebraik amalning ta’rifini va xossalarini keltiring, misollar keltiring.	Maydon ta’rifini keltiring, misol keltiring.	$K=\{a+b\sqrt{p} \mid a,b\in R\}$ to’plam maydon tashkil etishini isbotlang	$K=\{a+b\sqrt{3} \mid a,b\in Z\}$ to’plam additiv gruppa tashkil etishini isbotlang	$K=\{a-b\sqrt{p} \mid a,b\in Z; p-tub\ son\}$ to’plam additiv gruppa tashkil etishini isbotlang
6.		Gruppa ta’rifini keltiring. Uning asosiy xossalarini ayting.	Halqaning ta’rifini keltiring, misol keltiring.	$G=\{a+b\sqrt{2} \mid a,b\in Q\}$ to’plamni halqa tashkil etishini isbotlang	$G=\{a-b\sqrt{p} \mid a,b\in Z; p-tub\ son\}$ to’plamni halqa tashkil etishini isbotlang	$K=\{a+b\sqrt{p} \mid a,b\in R\}$ va $P=\{a+b\sqrt{q} \mid a,b\in R\}$ to’plamlar tashkil etgan maydonlar orasida izomorfizm o’rnating.
7.	Kompleks sonlar maydonini qurish, kompleks sonlar ustida amallar	Kompleks sonlarni ko’paytirishning asosiy xossalarini keltiring, ularni isbotlang.	Kompleks sonning moduli va argumenti tushunchasi.	$z_1=5+2i$ va $z_2=2+3i$ kompleks sonlar berilgan bo’lsa ularning yig’indisi, ayirmasini toping	$z_1=5-2i$ va $z_2=2+3i$ kompleks sonlar berilgan bo’lsa ularning ko’paytmasi va bo’linmasini toping	$\lvert z_1\cdot z_2\rvert=\lvert z_1\rvert\cdot\lvert z_2\rvert$ ni isbotlang.
8.	Kompleks sonlarning trigonometrik ko‘rinishi.	Algebraik ko’rinishdagi kompleks sonlarning	Trigonometrik ko’rinishdagi kompleks	$z_1=1-i$ va $z_2=1+i$ kompleks sonlarni trigonometrik shaklga keltirib ko’paytmasi va nisbatini toping	$\lvert z^{-1}\rvert=\lvert z\rvert^{-1}(z\neq 0)$ ni isbotlang.	$\lvert z_1+z_2\rvert\leq\lvert z_1\rvert+\lvert z_2\rvert$ ni isbotlang.

		aniqlanishi, ular ustida amallar.	sonning aniqlanishi.			
9.	Kompleks sonni darajaga ko‘tarish. Muavr formulasi.Kompleks sonning n -darajali ildizlari.	Trigonometrik ko’rinishdagi kompleks sonlarni darajaga ko’tarish haqidagi Muavr formulasi keltiring va isbotlang.	Trigonometrik ko’rinishdagi kompleks sondan n darajali ildiz chiqarish formulasini keltirib chiqaring.	$z = 1 + \sqrt{3}i$ kompleks sonning 20-darajasini toping	$z_1 = 1 - i$ va $z_2 = 1 + i$ kompleks sonlarni trigonometric shaklga keltirib nisbatini toping. Hamda natijani 10-darajaga ko’taring	Muavr formulasi yordamida $(1+i)^{24}$ ifodani soddalashtiring
10.		Kompleks sonning qo’shmasi va uning xossalari.	Trigonomerik ko’rinishdagi kompleks sonlarni bo’lish qanday bajariladi? Misollar keltiring.	$z = \frac{1}{\sqrt{2}} + \frac{\sqrt{2}}{2}i$ kompleks sonning 3-darajali ildizlarini toping	Muavr formulasi yordamida $(1+\sqrt{3}i)^{16}$ ifodani soddalashtiring	$\sqrt[3]{1-i}$ ning barcha ildizlarini toping.
11.	Boshlang‘ich ildizlar. Bir sonining kompleks ildizlari	Bir sonining n-darajali ildizlari va ularning ko’paytirishga nisbatan guruh tashkil qilishini ko’rsating.	Kompleks tekislikda qutb koordinatalar sistemasi qanday kiritiladi?	Birning 4-darajali ildizlarini toping	$z = 1$ tenglamaning 5-darajali ildizlarini toping	$\sqrt[4]{1+i}$ ning barcha ildizlarini toping.
12.		Trigonomerik ko’rinishdagi kompleks	Boshlang’ich ildizlar.	$\sqrt[3]{1+i}$ ning barcha ildizlarini toping.	$z = 1$ tenglamaning 6-darajalarini toping	$\sqrt[4]{1-i}$ ning barcha ildizlarini toping.

		sonlarni ko’paytirish qanday bajariladi? Misollar keltiring.				
13.	n-o‘lchovli arifmetik fazo. n-o‘lchovli vektorlar sistemasi uchun chiziqli bog‘liqlik va chiziqli erklilik tushunchalari. n-o‘lchovli vektorlar sistemasi uchun rang tushunchasi.	n-o’lchovli vektorlarning yig’indisi va sonni vektorga ko’paytmasi ta’rifini keltiring, misollar keltiring.	n-o’lchovli arifmetik vektor fazo ta’rifini keltiring, misollar keltiring.	Quyidagi vektorlar sistemasi va ularning chiziqli kombinatsiyasi berilgan: $\vec{a}_1(1,-3), \vec{a}_2(2,5), \vec{a}_3(-2,1)$ va $-\overrightarrow{a_1}+\overrightarrow{a_2}+2\overrightarrow{a_3}$. Chiziqli kombinatsiyalar koordinatalarini toping.	Agar A(2;0;4), B(5;2;4), C(−2;6;5), D(0;6;3) berilgan bo‘lsa, $\vec{a}=\overrightarrow{AB}-\overrightarrow{CD}$vektorni toping.	A(-4;0;2), B(-1;2;-2), C(6;-2;4) uchburchak uchlari koordinatalari bo‘lsa, mediana chizig‘ini ifodalovchi BE vektor koordinatalarini aniqlang.
14.		Vektorlarning chiziqli bog’langan sistemasining ta’rifini keltiring, misollar keltiring.	Vektorlarning chiziqli bog’liq bo’lmagan sistemasini ta’rifini keltiring, misollar keltiring.	$\vec{a}(2;-3;4)$, $\vec{b}(5;3;-2)$ vektorlarga qurilgan parellelogramning diagonallarini ifodalovchi vektorlarni toping.	Agar $A(2;0;4)$, $B(5;2;4)$, $C(-2;6;5)$, $D(-5;6;3)$ berilgan bo‘lsa, $\vec{a}=\overrightarrow{AB}+\overrightarrow{CD}$ vektorni toping.	A(-4;0;2), B(-1;2;-2), C(6;-2;4) uchburchak uchlari koordinatalari bo‘lsa, mediana chizig‘ini ifodalovchi $\overrightarrow{BE}$ vektor koordinatalarini aniqlang.
15.	Chiziqli tenglamalar sistemasi, ularning matrisalari, Gauss usuli. Bir jinsli	n ta noma’lumli m ta chiziqli tenglamalar sistemasi deb nimaga aytiladi	Bir jinsli chiziqli tenglamalar sistemasi deb nimaga aytiladi?	Quyidagi tengalamalar sistemasini Gaus usuli bilan yeching $\begin{cases} x-2y=1-i, \\ 2x-4y=2-2i; \end{cases}$	Quyidagi tengalamalar sistemasini Gaus usuli bilan yeching $\begin{cases} x-2y=1-i, \\ 2x-4y=2+i; \end{cases}$	Quyidagi tengalamalar sistemasini Gaus usuli bilan yeching $\begin{cases} 3x_1-2x_2-5x_3+x_4=3, \\ 2x_1-3x_2+x_3+5x_4=-3, \\ x_1+2x_2-4x_4=-3, \\ x_1-x_2-4x_3+9x_4=22; \end{cases}$

16.	tenglamalar sistemasi. Yechimga ega bo’lishlik va ega bo’lmaslik shartlari	Bir jinsli tenglamalar sistemasi. Yechimga ega bo’lishlik va ega bo’lmaslik shartlari	Chiziqli tenglamalar siztemasini yechishning Gaus usuli	Quyidagi tengalamalar sistemasini Gaus usuli bilan yeching $\begin{cases} 2x-y-6z+3t+1=0, \\ 7x-4y+2z-15t+32=0, \\ x-2y-4z+9t-5=0, \\ x-y+2z-6t+8=0; \end{cases}$	Quyidagi tengalamalar sistemasini Gaus usuli bilan yeching $\begin{cases} 2x+y+4z+8t=-1, \\ x+3y-6z+2t=3, \\ 3x-2y+2z-2t=8, \\ 2x-y+2z\quad=4; \end{cases}$	Quyidagi tengalamalar sistemasini Gaus usuli bilan yeching $\begin{cases} 2x_1+3x_2-x_3+x_4=1, \\ 8x_1+12x_2-9x_3+8x_4=3, \\ 4x_1+6x_2+3x_3-2x_4=3, \\ 2x_1+3x_2+9x_3-7x_4=3; \end{cases}$
17.	Tartibi yuqori bo‘lmagan determinantlar. O‘rin almashtirishlar va o‘rniga qo‘yishlar	Ikkinchi tartibli determinantlar ularni hisoblash usullari. xossalari	Uchinchi tartibli determinantlar ularni hisoblash usullari. xossalari	Determinantni hisoblang $\begin{vmatrix} -1 & 2 & 7 & 5 \\ 1 & 3 & -1 & 2 \\ 2 & 1 & 2 & 3 \\ -5 & 2 & -1 & 3 \end{vmatrix}$	Determinantni hisoblang $\begin{vmatrix} 1 & 3 & 3 & 1 \\ 3 & 4 & 3 & 2 \\ 3 & 2 & 1 & 4 \\ 2 & 4 & 2 & 3 \end{vmatrix}$	Determinantni hisoblang $\begin{vmatrix} 5 & -1 & 3 & -3 & 1 \\ 8 & 4 & 1 & 0 & 1 \\ 13 & 3 & 4 & -3 & 2 \\ 3 & 2 & -2 & 4 & -5 \\ 7 & -6 & 0 & 8 & 1 \end{vmatrix}$
18.		O‘rin almashtirishlar	o‘rniga qo‘yishlar	$f(x)=x^2-2x+1,\ A=\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix};$ $f(A)$ ni hisoblang	$f(x)=(x-\varepsilon)^2,\quad A=\begin{pmatrix} \varepsilon & 1 \\ -1 & \varepsilon \end{pmatrix};$ $f(A)$ ni hisoblang	$f(A)$ ni hisoblang $f(x)=x^2+x+1,\quad A=\begin{pmatrix} -1 & 1 & 1 \\ -5 & 21 & 17 \\ 6 & -26 & -21 \end{pmatrix};$
19.	n-tartibli determinantlar va ularning xossalari.	$\boldsymbol{n}$ –tartibli determinant ta’rifini keltiring	Determinantni biror satri bo’yicha yoyish qanday bajariladi?	Yuqori tartibli determinantni hisoblang: $\begin{vmatrix} 5 & -5 & -3 & 4 & 2 \\ -4 & 4 & 3 & 6 & 3 \\ 3 & -1 & 5 & -9 & -5 \\ -7 & 7 & 6 & 8 & 4 \\ 5 & -3 & 2 & -1 & -2 \end{vmatrix}$	Yuqori tartibli determinantni hisoblang: $\begin{vmatrix} 5 & 9 & -2 & -4 & 5 \\ 2 & -3 & 4 & -3 & 3 \\ -5 & -7 & 2 & 4 & -2 \\ 4 & -5 & 8 & -6 & 8 \\ 6 & -5 & 3 & -3 & 7 \end{vmatrix}$	Yuqori tartibli determinantni hisoblang: $\begin{vmatrix} 2 & -3 & 7 & 1 & 9 & 11 \\ 1 & 0 & 3 & 0 & -4 & 0 \\ 7 & 4 & 9 & -1 & 11 & -5 \\ 1 & 0 & -1 & 0 & 1 & 0 \\ 9 & -4 & 11 & 1 & 13 & 2 \\ 4 & 0 & 1 & 0 & -1 & 0 \end{vmatrix}$

20.		Determinant minorining algebraik to'ldiruvchisi ta'rifi keltiring, misolda tushuntirib bering.	Determinantning 8-xossasini keltiring va umumiy holda ikkinchi tartibli determinantlar uchun isbotlang.	Yuqori tartibli determinantni hisoblang: $\begin{vmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 1 & 2 & 3 & 4 \\ 0 & 2 & 1 & 2 & 3 \\ 0 & 0 & 2 & 1 & 2 \\ 0 & 0 & 0 & 2 & 1 \end{vmatrix}$	Yuqori tartibli determinantni hisoblang: $\begin{vmatrix} 1 & 0 & 2 & 0 & 3 \\ 0 & 2 & 0 & 3 & 0 \\ 2 & 0 & 3 & 0 & 4 \\ 0 & 3 & 0 & 4 & 0 \\ 3 & 0 & 4 & 0 & 3 \end{vmatrix}$	Yuqori tartibli determinantni hisoblang: $\begin{vmatrix} 2 & 3 & 1 & 2 & 9 & 8 \\ 3 & 4 & 2 & 7 & 5 & 3 \\ 0 & 0 & 5 & 3 & 3 & 1 \\ 0 & 0 & 8 & 5 & 7 & 5 \\ 0 & 0 & 0 & 0 & 9 & 7 \\ 0 & 0 & 0 & 0 & 4 & 3 \end{vmatrix}$
21.	Minorlar va algebraik to'ldiruvchilar. Laplas teoremasi.	Determinantning $k-$tartibli minori qanday aniqlanadi? Misollar keltiring.	k-tartibli algebraik to'ldiruvchi qanday aniqlanadi? Misollar keltiring.	3-satr elementlari bo'yicha yoyib determinantni hisoblang: $\begin{vmatrix} \frac{1}{3} & -\frac{5}{12} & \frac{2}{5} & \frac{3}{2} \\ 3 & -12 & \frac{21}{5} & 15 \\ \frac{2}{3} & -\frac{9}{2} & \frac{4}{5} & \frac{5}{2} \\ -\frac{1}{7} & \frac{2}{7} & -\frac{1}{7} & \frac{3}{7} \end{vmatrix}$	2-ustun elementlari bo'yicha yoyib determinantni hisoblang: $\begin{vmatrix} \frac{2}{3} & \frac{4}{8} & \frac{6}{9} & 1 \\ 1 & \frac{1}{2} & \frac{1}{3} & -1 \\ \frac{5}{6} & \frac{1}{3} & \frac{3}{5} & 2 \\ \frac{1}{7} & \frac{1}{3} & \frac{1}{2} & -\frac{1}{4} \end{vmatrix}$	1-satr elementlari bo'yicha yoyib determinantni hisoblang: $\begin{vmatrix} 1 & 2 & 3 & 4 \\ 2 & 2 & 1 & 4 \\ 3 & 1 & 3 & 3 \\ 4 & 4 & 3 & 4 \end{vmatrix}$
22.		Zinapoyali determinant ta'rifini keltiring, misolda tushuntiring	Laplas teoremasini keltiring, misolda tushuntirib bering.	Laplas teoremasidan foydalanib determinantni hisoblang $\begin{vmatrix} 1 & 0 & 0 & -1 \\ 2 & 3 & 4 & 7 \\ -3 & 4 & 5 & 9 \\ -4 & -5 & 6 & 1 \end{vmatrix}$	Laplas teoremasidan foydalanib determinantni hisoblang $\begin{vmatrix} 5 & 62 & -79 & 4 \\ 0 & 2 & 3 & 0 \\ 6 & 183 & 201 & 5 \\ 0 & 3 & 4 & 0 \end{vmatrix}$	Laplas teoremasidan foydalanib determinantni hisoblang $\begin{vmatrix} 3 & -1 & 5 & 2 \\ 2 & 0 & 7 & 0 \\ -3 & 1 & 2 & 0 \\ 5 & -4 & 1 & 2 \end{vmatrix}$

23.	Matrisalar algebrasi. Teskari matrisa tushunchasi. Matrisalarning turlari.	Matrisalarni qo'shish qanday aniqlanadi? Matrisani songa ko'patirishchi?	Berilgan matrisaga teskari matrisa deb qanday matrisaga aytiladi?	Chiziqli ifodani hisoblang $3\begin{pmatrix}1&2\\1&2\end{pmatrix}-\begin{pmatrix}3&2\\3&2\end{pmatrix}-4\begin{pmatrix}0&1\\0&1\end{pmatrix};$	Chiziqli ifodani hisoblang $2\begin{pmatrix}1&8&7&-15\\1&-5&-6&11\end{pmatrix}-\begin{pmatrix}5&24&-7&-1\\-1&2&7&3\end{pmatrix};$	$\begin{pmatrix}-1&1&1\\-5&21&17\\6&-26&-21\end{pmatrix}^2$; ni hisoblang
24.		Qanday matrisaga maxsusmas matrisa, qanday matrisaga maxsus matrisa deyiladi?	Maxsusmas matrisalar uchun teskari matrisani topish usuli nimadan iborat?	$\begin{pmatrix}\lambda_1&&0\\&\mathrm{O}&\\0&&\lambda_n\end{pmatrix}\begin{pmatrix}0&&\lambda_1\\&\mathrm{N}&\\\lambda_n&&0\end{pmatrix}$ ni hisoblang.	$\begin{pmatrix}1&1\\1&1\end{pmatrix}^n$; ni hisoblang.	$\begin{pmatrix}1&1\\0&1\end{pmatrix}^n$; ni hisoblang.
25.	Matrisa rangi. Matrisa rangi haqidagi asosiy teorema.	Matrisaning rangi deb nimaga aytiladi?	Matrisaning rangi haqidagi teorema qanday ifodalanadi?	$\begin{pmatrix}2&-2&1\\2&1&-2\\1&2&2\end{pmatrix}$ matritsaning rangini toping	$\begin{pmatrix}2&-2&1\\2&1&-2\\1&2&2\end{pmatrix}$ matritsaga teskari matritsani tuzing	$\begin{pmatrix}\cos\alpha&-\sin\alpha\\\sin\alpha&\cos\alpha\end{pmatrix}$ matritsaga teskari matritsani tuzing
26.		Matrisalarning ko'paytmasi yig'indi amaliga nisbatan distributivligini isbotlang.	Qanday shartda matrisalar ko'paytmasi AB aniqlanadi? Qanday shartda AB va BA aniqlangan bo'ladi?	Matritsaning rangini toping $\begin{pmatrix}2&7&3\\3&9&4\\1&5&3\end{pmatrix}$	Matritsaga teskari matritsani tuzing $\begin{pmatrix}a&b\\c&d\end{pmatrix}$	Matritsaga teskari matritsani tuzing $\begin{pmatrix}1&1&1&...&1\\0&1&1&...&1\\0&0&1&...&1\\...&...&...&...&...\\0&0&0&...&1\end{pmatrix}$
27.	Chiziqli tenglamalar sistemasining	Kramer qoidasini keltiring va	Qanday shartda bir jinsli CHTSi nolmas	Quyidagi tengalamalar sistemasini Kramer usuli bilan yeching	Quyidagi tengalamalar sistemasini Kramer usuli bilan yeching	Quyidagi tengalamalar sistemasini Kramer usuli bilan yeching

	umumiy nazariyasi. Kroneker-Kapelli teoremasi.	biror misolga tadbiq qiling.	yechimga ega bo’ladi?	$\begin{cases} x-2y=1-i, \\ 2x-4y=2-2i; \end{cases}$	$\begin{cases} x-2y=1-i, \\ 2x-4y=2+i; \end{cases}$	$\begin{cases} 3x_1-2x_2-5x_3+x_4=3, \\ 2x_1-3x_2+x_3+5x_4=-3, \\ x_1+2x_2-4x_4=-3, \\ x_1-x_2-4x_3+9x_4=22; \end{cases}$
28.		Kroneker-Kapelli teoremasining zaruriy qismini isbotlang	Kroneker-Kapelli teoremasining yetarli qismini isbotlang	Quyidagi tengalamalar sistemasini Kramer usuli bilan yeching $\begin{cases} 2x-y-6z+3t+1=0, \\ 7x-4y+2z-15t+32=0, \\ x-2y-4z+9t-5=0, \\ x-y+2z-6t+8=0; \end{cases}$	Quyidagi tengalamalar sistemasini Kramer usuli bilan yeching $\begin{cases} 2x+y+4z+8t=-1, \\ x+3y-6z+2t=3, \\ 3x-2y+2z-2t=8, \\ 2x-y+2z=4; \end{cases}$	Quyidagi tengalamalar sistemasini Kramer usuli bilan yeching $\begin{cases} 2x_1+3x_2-x_3+x_4=1, \\ 8x_1+12x_2-9x_3+8x_4=3, \\ 4x_1+6x_2+3x_3-2x_4=3, \\ 2x_1+3x_2+9x_3-7x_4=3; \end{cases}$
29.	Bir jinsli tenglamalar sistemasi. Fundamental yechimlar sistemasi. Bir jinsli va bir jinsli bo’lmagan tenglamalar sistemalari yechimlari orasidagi munosabatlar.	n ta noma’lumli n ta bir jinsli chiziqli tenglamalar sistemasining nolmas yechimi mavjud bo’lishining sharti nimadan iborat?	Noma’lumlari soni tenglamalari soniga teng bo’lgan bir jinsli tenglamalar sistemasining nechta yechimi bor? Javobingizni asoslab bering.	Sistemaning fundamental yechimlari sistemasini toping $\begin{cases} x_1-x_2=0, \\ 2x_1-2x_2=0; \end{cases}$	Sistemaning fundamental yechimlari sistemasini toping $\begin{cases} x_1-x_2+x_3=0, \\ 2x_1+x_2-x_3=0; \end{cases}$	Sistemaning fundamental yechimlari sistemasini toping $\begin{cases} x_1-2x_2+x_3-x_4+x_5=0, \\ x_1+2x_2-2x_3+3x_4-4x_5=0, \\ 2x_1-5x_2+x_3-2x_4+2x_5=0, \\ 4x_1-4x_2-x_5=0; \end{cases}$
30.		Asosiy matrisasining rangi tenglamalari soniga teng bo’lgan bir jinsli tenglamalar	Bir jinsli bo’lmagan tenglamalar sistemasi yechimga ega bo’lmasligi uchun qanday shart bajarilishi	Sistemaning fundamental yechimlari sistemasini toping $\begin{cases} 3x_1+2x_2+x_3+3x_4+5x_5=0, \\ 6x_1+4x_2+3x_3+5x_4+7x_5=0, \\ 9x_1+6x_2+5x_3+7x_4+9x_5=0, \\ 3x_1+2x_2+4x_4+8x_5=0; \end{cases}$	Sistemaning fundamental yechimlari sistemasini toping $\begin{cases} 6x_1-2x_2+2x_3+5x_4+7x_5=0, \\ 9x_1-3x_2+4x_3+8x_4+9x_5=0, \\ 6x_1-2x_2+6x_3+7x_4+x_5=0, \\ 3x_1-x_2+4x_3+4x_4-x_5=0; \end{cases}$	Sistemaning fundamental yechimlari sistemasini toping $\begin{cases} 5x_1+6x_2-2x_3+7x_4+4x_5=0, \\ 2x_1+3x_2-x_3+4x_4+2x_5=0, \\ 7x_1+9x_2-3x_3+5x_4+6x_5=0, \\ 5x_1+9x_2-3x_3+x_4+6x_5=0; \end{cases}$

		sistemasining nechta yechimi bor? Javobingizni asoslab bering.	kerak? Javobingizni asoslab bering			