Kattaqo‘rg‘on davlat pedagogika instituti Aniq va tabiiy fanlar fakulteti

1-bosqich Matematika (Kechki) yo‘nalishi talabalarig 1-semestr uchun

« Analitik geometriya » fanidan yakuniy nazorat savollari

Imtihon shakli: yozma

TASDIQLAYMAN
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2026-yil 14-oktabr

Mavzu raqami	**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	Vektor tushunchasiga ta’rif bering va geometrik taxlilni keltiring?	Vektor yig’indini uchburchak va parallelogram usullarini tushuntiring?	$\bar{a}$ va $\bar{b}$ vektorlarning berilishiga ko‘ra ularning quyidagi chiziqli kombinatsiyalarini yasang: $3\bar{a}+\frac{1}{2}\bar{b}$	$\bar{A}\bar{B}=\bar{c}$, $\bar{B}\bar{C}=\bar{a}$, $\bar{C}\bar{A}=\bar{b}$ vektorlar ABC uchburchakning tomonlari. ABC uchburchakning $\bar{A}\bar{Q}$,$\bar{B}\bar{N}$,$\bar{C}P$ medianalaridan iborat vektorlarni $\bar{a}$, $\bar{b}$, $\bar{c}$ vektorlar orqali ifodalang.	ABCDA1B1C1D1 parallelepiped berilgan bo‘lsa, $\bar{A}\bar{B}+\bar{A}\bar{D}+\bar{A}\bar{A}1$ yig‘indi vektorni toping.
1	Vektorlarni qo’shish va songa ko’paytirish xossalarini keltiring?	Vektorlarni kollinearligi ta’rifi va tasdig’ini keltiring?	ABCD parallelogrammning ikkita qo‘shni tomoni $\bar{A}\bar{B}=\bar{a}$, $\bar{A}\bar{D}=\bar{b}$, diagonallarining kesishish nuqtasi esa M bo‘lsa, $\bar{M}\bar{A}$, $\bar{M}\bar{B}$, $\bar{M}\bar{C}$,	M nuqta ABC uchburchak medianalarining kesishgan nuqtasi bo‘lsa, $\bar{M}\bar{A}+\bar{M}\bar{B}+\bar{M}\bar{C}=0$ ekanligini isbotlang.	ABC uchburchak va uning og‘irlik markazi G berilgan bo‘lsa, u holda ixtiyoriy M nuqta uchun $\bar{M}\bar{G}=\frac{1}{3}(\bar{M}\bar{A}+\bar{M}\bar{B}+\bar{M}\bar{C})$ ekanligini isbotlang.

			$\overline{MD}$ vektorlarni $\overline{a}$ va $\overline{b}$ vektorlar orqali ifodalang.		
2	Komplanar vektorlar ta’rifini bering va geometrik taxlilini keltiring?	Chiziqli erkli va chiziqli bog’lanishli vektorlar oilasi ta’rifini hamda teoremasini keltiring?	B(4, -2, 0) nuqta $\overline{a}$(2, -3, -1) vektorning oxiri bo‘lsa, bu vektor boshining koordinatalarini toping.	ā (2, -3) va ƀ (-3, 4) vektorlar berilgan. Agar $\overline{a}$=-c $\overline{}$+3$\overline{b}$ bo‘lsa, c vektorning koordinatalarini toping.	To‘rtburchakning uchta M(2, -4), N(-4, 0), P(2, -2) uchlari berilgan. Agar $\overline{MN}$=4 $\overline{QP}$bo‘lsa, Q uchining koordinatalarini toping.
2	Qanday vektorlar chiziqli bog’lanishli deyiladi (teoremalardan birini isbotini keltiring)?	Vektorning o’qdagi proeksiyasini tushuntiring va xossalarini keltiring (isbotlang)?	ā (2, 3), ƀ (3, -2), $\overline{c}$(4, 19) vektorlar uchun $\overline{c}$ = $\overline{m}$a + n $\overline{}$b tenglik o‘rinli bo‘lsa, m $\overline{}$n ko‘paytmaning qiymatini toping.	Tekislikda biror bazisga nisbatan uchta vektor o‘zining koordinatalari bilan berilgan: $\overline{a}$(2, 3), $\overline{b}$(-3, 1), $\overline{c}$(5, 2). $\overline{c}$ vektorni $\overline{a}$ va $\overline{b}$ vektorlar orqali ifoda qiling.	Tekislikda quyidagi vektorlar berilgan: ā (3,1),$\overline{b}$(-2,3),$\overline{c}$(-8,1). Bazis vektorlar sifatida bu vektorlarning ixtiyoriy ikkitasini olib, ular orqali uchinchisining yoyilmasini yozing.
3	Tekislikda affin sistema (reper)ni tushuntiring?	Tekisli affin koordinatani tushuntiring?	M(5; 3) va N(2; -1) nuqtalar orasidagi masofani toping.	A(-3;-1)va B(5; 3) nuqtalar orasidagi masofani toping	A(5;3) va B(6; -4) nuqtalar orasidagi masofani toping.
3	Kesmani berilgan nisbatda bo’lishni vektor orqali keltirib chiqaring?	To’g’ri burchakli dekart koordinatalar sistemasini affin sistema orqali ta’riflang?	ABC uchburchak uchlarining koordinatlari berilgan: A(5;3), B(2;-1), C(-1;4). Uchburchak tomonlari uzunliklarini toping.	Uchlari A(4; 3), B(-3; 2) va C(1;-6) nuqtalarda bo‘lgan uchburchakka tashqi chizilgan doiraning markazi va radiusi topilsin.	Ordinatalar o‘qida koordinatlar boshidan va A(-2;5) nuqtadan baravar uzoqlikda turgan nuqta topilsin.

4	Fazoda affin sistema (reper)ni tushuntiring?	Fazoda affin sistemada *M* nuqtaning vaziyatini tushuntiring?	M(12,-3,4) nuqtaning koordinatalar boshidan va koordinatalar o‘qlaridan uzoqliklarini toping.	Uchlari A(2,0,8), B(7,-15,-4), C(-1,-1,11), D(-4,8,-1) nuqtalarda yotgan trapetsiya ekanligini isbotlang.	M1(7,9,-8), M2(-2, 3, 4), M3(-5, 1, 8) nuqtalarning bir to‘g‘ri chiziqda yotishini isbotlang.
4	Fazoda Dekart koordinatalar sistemasi (reper)ni tushuntiring?	Fazoda kesmani berilgan nisbatda bo‘lishni tushuntiring?	Uchlari A(1,1,1), B(5,1,-2), C(7,9,1) nuqtalarda bo‘lgan uchburchak berilgan. A burchak bissektrisasining CB tomon bilan kesishgan D nuqtaning koordinatalarini toping.	A(2,4,2)vaB(2,4,2)nuqtalar berilgan. AB to‘g‘ri chiziqni $\lambda = 3$ nisbatda bo‘luvchi C nuqtani toping.	M1(1,-2,5), M2(4,-2,2) nuqtalar berilgan.[M1 M2]kesmani $\lambda = 1:2$ nisbatda bo‘luvchi M(x, y, z) nuqtani toping.
5	Vektorning skalyar ko’paytmasi ta’rifini keltiring?	Vektorning skalyar ko’paytmasi xossalarini keltiring?	$\bar{a}(1,-1,0)$, $\bar{b}(1,-2,2)$ vektorlar orasidagi burchakni toping.	ABCD to‘g‘ri to‘rtburchakning A(1,-2, 2), B(1, 4, 0), C(-4, 1, 1), D(-5,-5,3) uchlari berilgan. Uning diagonalari orasidagi α burchakni hisoblang.	ABC uchburchakning A(-1, -2, 4), B(-4,-2,0), C(3,-2,1)uchlari berilgan. B uchining tashqi burchagini toping.
5	Skalyar ko’paytmaning koordinatalardagi ifodasini keltiring?	Vektorning yo‘naltiruvchi cosinuslarini keltring?	$\bar{a}$ va $\bar{b}$ vektorlar orasidagi burchak asd 3 va $\lvert\bar{a}\rvert = 4$, $\lvert\bar{b}\rvert = 4$ ga teng bo‘lsa, $\bar{b}^2$, $\bar{b}^2$,	$\bar{O}\bar{A} = \bar{a}$, $\bar{O}\bar{B} = \bar{b}$ vektorlar va $\lvert\bar{a}\rvert = 2$, $\lvert\bar{b}\rvert = 4$, , lar berilgan. AOB uchburchakning $\bar{O}\bar{A}$	ABC uchburchakning A(-1, -2, 4), B(-4, -2, 0), C(3, -2, 1) uchlari berilgan. B uchining tashqi burchagini toping.

			$(\bar{a}+\bar{b})^2$, $(\bar{a}-\bar{b})^2$, $(3\bar{a}-2\bar{b})^2$, $(\bar{a}+2\bar{b})^2$, larni hisoblang.	tomoni va $\bar{O}\bar{M}$ medianasi orasidagi φ burchakni hisoblang.	
5	Vektorlarning vector ko‘paytmasini tushuntiring.	$\vec{i},\vec{j},\vec{k}$ bazis vektorlarning skalyar ko‘paytmalarini toping.	$\bar{a}=\{4,-2,-4\}$, $\bar{b}=\{6,-3,2\}$ vektorlar berilgan. $\bar{a}\bar{b}$, $\bar{a}^2$, $\bar{b}^2$, $(\bar{a}+\bar{b})^2$, $(\bar{a}-\bar{b})^2$,$(2\bar{a}-3\bar{b})(\bar{a}+2\bar{b})$ larni hisoblang.	φ ning qanday qiymatida $\bar{a}=\varphi\bar{\imath}-3\bar{\jmath}+2\bar{k}$ va $\bar{b}=\bar{\imath}+2\bar{\jmath}-\varphi\bar{k}$ vektorlar o‘zaro perpendikulyar bo‘ladi?	Yoyilmalarda $\lvert\bar{p}\rvert=2\sqrt{2}$, $\lvert\bar{q}\rvert=4$ va $\phi=\frac{\pi}{2}$ ekanligi ma'lum bo‘lsa, $\bar{a}=5\bar{p}+2\bar{q}$ va $\bar{b}=\bar{p}-3\bar{q}$ vektorlarga yasalgan parallelogramm diagonallarining uzunligi hisoblansin.
6	Vektorning vektor ko’paytmasi ta’rifini keltiring?	Vektor ko’paytmaning xossalarini keltiring	$\bar{a}=\{0,-1,1\}$ va $\bar{b}=\{1,1,1\}$ vektorlardan yasalgan parallelogramning yuzini hisoblang.	$\bar{a}$ va $\bar{b}$ vektorlar o’zaro perpendikulyar hamda $\lvert\bar{a}\rvert=3$, $\lvert\bar{b}\rvert=4$ bo’lsa, $(\bar{a}+\bar{b})\times(\bar{a}-\bar{b})$,$(3\bar{a}-\bar{b})\times(5\bar{a}-6\bar{b})$ larni hisoblang.	F={2,2,9} kuch A(4,2,-3) nuqtaga qo’yilgan. Bu kuchning B(2,4,0) nuqtasiga nisbatan $\bar{M}$ vektorning momentini toping va yo’naltiruvchi kosinuslarini hisoblang.
6	Vektorning aralash ko’paytmasi ta’rifini va geometrik taxlilini keltiring?	Vektorning aralash ko’paytmasi xossalarini keltiring?	Agar $\lvert\bar{a}\rvert=3$, $\lvert\bar{b}\rvert=4$, $(\bar{a}\,\hat{}\,\bar{b})=45^\circ$ bolsa, tomonlari $\bar{m}=\bar{a}+3\bar{b}$ va $n=4\bar{a}+\bar{b}$ vektorlardan iborat parallelogrammning yuzini hisoblang.	Quyidagi vektorlarga yasalgan parallelogrammning dioganallari orasidagi burchakning sinusi hisoblansin: $\bar{a}=2\bar{m}+\bar{n}-\bar{p}$ va $\bar{b}=\bar{m}-3\bar{n}+p$; bunda $\bar{m},\bar{n},\bar{p}$ - o’zaro perpendikulyar ortlardir.	$\bar{a}=4\bar{\imath}+4\bar{k}$, $\bar{b}=-\bar{\imath}+3\bar{\jmath}+2\bar{k}$ va $\bar{c}=3\bar{\jmath}+5\bar{\jmath}$ vektorlar berilgan: 1. a) $\bar{a}$, $\bar{b}$ va $5\bar{c}$ vektorlarning aralash ko’paytmasini hisoblang; 2. b)$3\bar{c}$ va $\bar{b}$ vektorlarning vector kopaytmasining modulini toping.
7	Tekislikda affin koordinatalar	Tekislikda dekart koordinatalar	$\beta=\{O,\bar{e}1,\bar{e}2,\bar{e}3\}$sistema ga nisbatan	M nuqta $\beta=\{O,\bar{e}1,\bar{e}2,\bar{e}3\}$ da M(0, 1, -	$\beta=O,\bar{e}1,\bar{e}2,\bar{e}3\}$ da $\bar{e}’1(1,0,2)$, $\bar{e}’2$ (1,0,-2), $\bar{e}’3(1,1,1)$

	sistemasini almashtirishni keltiring?	sistemasini almashtirishni keltiring?	$\bar{e}$'1(1,0,0),$\bar{e}$'2(0,1,0), $\bar{e}$'3(0,0,1),O'(1,-3,5)lar berilgan β dan β'={O', $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3} ga o'tishdagi koordinatalarni almashtirish formulalarini yozing. β da berilgan M(1,1,3) nuqtaning β'dagi koordinatalarini toping	3) ko'rinishda, β={O', $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3 } da esa M(2, -3, 5) ko'rinishda berilgan bo'lsa, koordinatalar boshi ko'chirilgan O' nuqtaning β dagi koordinatalarini toping.	vektorlar berilgan. $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3 sistema bazis ekanligini ko'rsating va β={O', $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3 } dagi o'tishdagi koordinatalarni almashtirish formulalarini yozing, M(3,1,-4) ning β dagi $\bar{e}$1,$\bar{e}$2,$\bar{e}$3 larning koordinatalarini toping.
7	Fazoda affin koordinatalar sistemasini almashtirishni keltiring?	Fazoda dekart koordinatalar sistemasini almashtirishni keltiring?	OABS tetraedr berilgan, $\bar{O}\bar{A}$= $\bar{e}$1, $\bar{O}\bar{B}$= $\bar{e}$2, $\bar{O}\bar{S}$= $\bar{e}$3 deb olib, β = {O, $\bar{e}$1,$\bar{e}$2,$\bar{e}$3 } affin sistemasidan O'=A,$\bar{e}$'1=$\bar{A}\bar{O}$, ,$\bar{e}$'2=$\bar{A}\bar{B}$, $\bar{e}$'3=$\bar{A}\bar{S}$ bo'lgan β '={O', $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3} sistemaga o'tishdagi koordinatalarni almashtirish formulalarini yozin	β ={O, $\bar{e}$1,$\bar{e}$2,$\bar{e}$3 } sistemadan β={O',$\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3} sistemaga o'tishdagi ixtiyoriy nuqtaning bu ikki sistemaga nisbatan koordinatalari orasidagi bog'lanish ushbu x=x'-2y'+3z'-4, y=5x'-y'-z', z=z'+1 formulalar bilan berilgan. O' $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3 nuqtaning va vektorlarning β dagi koordinatalarini toping.	β={O,$\bar{e}$1,$\bar{e}$2,$\bar{e}$3} da $\bar{e}$'1(-1,1,0), $\bar{e}$'2 (2,-1,0), $\bar{e}$'3 (0,0,5), O'(5,0,-2) lar berilgan. β dan β '={O', $\bar{e}$'1,$\bar{e}$'2,$\bar{e}$'3} ga o'tishdagi koordinatalarni almashtirish formulalarini yozing va β' da berilgan M(1,-3,4) nuqtaning β dagi koordinatalarini toping.
8	Qutb koordinatalar sistemasini tushuntiring?	Qutb va dekart koordinatalar orasidagi bog'lanishni keltiring?	Dekart koordinatalar sistemasida M(-5, 5), N(2,-7), P(9,0), Q(0,-6)	Qutb burchaklari 0˚, 15˚, 30˚, 45˚, 60˚, 75˚, 90˚ ga teng bo'lgan,	Qutb o'qiga nisbatan M1$(1,\frac{\pi}{4})$,

			nuqtalar berilgan. Ularning qutb koordinatalarini toping.	mos radius-vektori r = 2cos2ϕ formula bo‘yicha hisoblanuvchi nuqtalarni yasab, ularni uzluksiz egri chiziq bilan ketma-ket tutashtiring.	$M2(5, -\frac{\pi}{2})$, $M3(7, -\frac{\pi}{4})$, $M4(4, \frac{\pi}{6})$ nuqtalarga simmetrik bo‘lgan nuqtalarning qutb koordinatalarini toping.
8	Sferik koordinatalar sistemasini keltiring?	Silindrik koordinatalar sistemasini keltiring?	Qutbga nisbatan $M1(5,\frac{\pi}{4})$, $M2(3, \frac{\pi}{2})$, $M3(1, -\frac{\pi}{3})$, $M4(2, \frac{5\pi}{6})$ nuqtalarga nuqtalarga simmetrik bo‘lgan nuqtalarning qutb koordinatalarini toping.	Qutb koordinata sistemasida kvadratning ikkita qarama-qarshi $A(6,\frac{7\pi}{2})$)va $B(4,\frac{\pi}{6})$ uchlari berilgan bo‘lsa, uning yuzini hisoblang.	Agar $A(8,-\frac{2\pi}{3})$) va $B(6,\frac{\pi}{3})$ nuqtalar berilgan bo‘lsa, [AB] kesma o‘rtasining qutb koordinatalarini toping.
9	Algebraik chiziq va uning tartibi haqida tushuncha bering?	Tekislikda to’g’ri chiziqning parametrik tenglamasini keltirib chiqaring?	5x-3y-15=0 to‘g‘ri chiziqning koordinata o‘qlari bilan kesishgan nuqtalarini toping va yasang.	Uchlari A(-3, -2), B(1, 2), C(4, -5) nuqtalarda bo‘lgan uchburchakning tomonlarining tenglamasini tuzing.	P(2,-8) va B(-1, 7) nuqtalardan o‘tgan to‘g‘ri chiziqning burchak koeffitsiyenti va ordinatalar o‘qidan ajratgan kesmasi topilsin.
9	Tekislikda to’g’ri chiziqning burchak koiftsentli va kesmalarga nisbatan tenglamalarini keltirib chiqaring?	Tekislikda to’g’ri chiziqning umumiy tenglamasi, xususiy xollari va normal tenglamalarini keltiring?	Tenglamasi bilan berilgan: 1) 2x-y+3=0; 2) 5x+2y-8=0; 3) 3x+8y+16=0 to‘g‘ri chiziqning burchak koeffitsiyenti va ordinatalar o‘qidan	Uchlarining koordinatalari (2, -1), (4, 5) va (-3, 2) bo‘lgan ABC uchburchakning og‘irlik markazi bilan koordinatalar boshini birlashtiruvchi to‘g‘ri	Uchlari A(-3, -2), B(1, 2), C(4, -5) nuqtalarda bo‘lgan uchburchakning medianalarining tenglamasini tuzing.

			ajratgan kesmasi topilsin.	chiziqning tenglamasi yozilsin.	
10	Nuqtadan to’g’ri chiziqqacha bo’lgan masofani keltirib chiqaring?	Ikki to’g’ri chiziq orasidagi burchakni toping?	P(8,5) nuqtadan 3x-4y-15=0 to‘g‘ri chiziqqacha masofani aniqlang	M(-2,-7) nuqtadan o‘tib, 7x+4y-2=0 to‘g‘ri chiziqqa parallel bo‘lgan to‘g‘ri chiziqning tenglamasini yozing;	B(5,-1) nuqtadan o‘tib, 3x+4y-8=0 to‘g‘ri chiziqqa perpendikular bo‘lgan to‘g‘ri chiziqning tenglamasini tuzing
10	Tekislikda ikki to’g’ri chiziqning o‘zaro joylashishini tushuntiring?	To’g’ri chiziqlar dastasi tenglamasini keltiring?	t ning qanday qiymatlarida 3x-8y+1=0 va (t+8)x-2ty=0 to‘g‘ri chiziqlar parallel bo‘ladi?	Koordinatalar boshidan 4x+y-5=0 to‘g‘ri chiziqqa parallel to‘g‘ri chiziq o‘tkazing	Ikkita to‘g‘ri chiziq orasidagi burchak hisoblansin $\begin{cases} y=-3x \\ y=2x-1 \end{cases}$
11	Fazodagi tekislikning umumiy tenglamasini keltiring?	Fazoda tekislikning uch nuqtadan o’tuvchi tenglamasini keltiring?	Ushbu 3x-5y+z+15=0 tekislikning koordinata o‘qlaridan kesgan kesmalari hisoblansin.	Ushbu 3x-y+2z+15=0 va 5x+9y-3z-1=0 tekisliklar orasidagi burchak topilsin.	Quyidagi tekisliklarning o‘zaro vaziyatini aniqlang: 3x+5y+z-5=0; 8x+7y+4z-1=0
11	Fazoda nuqtadan tekislikgacha bo’lgan masofani topish formulasini keltirib chiqaring	Fazoda Ikki tekislik orasidagi burchani topishni keltiring?	Koordinatalar boshidan o‘tib, -2x+5y+6z-4=0 tekislikka parallel bo‘lgan tekislik tenglamasini toping.	M0(3,-2,5) nuqtadan o‘tib, x-2y+7z-5=0 tekislikka parallel bo‘lgan tekislik tenglamasini toping	Koordinatalar boshidan 6 birlik masofada o‘tib, koordinata o‘qlaridan kesgan kesmalari a:b:c=1:3:2 munosabat bilan bog‘langan tekislikning tenglamasi tuzilsin.
12	Fazoda ikki tekislikning o’zaro vaziyatini keltiring vabirinchi ixolini tushuntiring?	Fazoda ikki tekislikning o’zaro vaziyatini ikki va uchinchi ixolini tushuntiring?	6x-3y + 2z -14=0 tekislikdan 3 birlik masofada yotuvchi nuqtalar to'plamining tenglamasini toping.	M(-3, 1, 0) nuqtadan va x+2y-z+4=0, 3x-y+2z-1=0 tekisliklarning kesishish chizig'idan	3y + 2z + 6 = 0 va 2x + 5y + 6z + 4=0 tekisliklarning kesishish chizig'idan va koordinatalar boshidan o'tgan tekislik tenglamasini tuzing.

				o'tgan tekislik tenglamasini toping.	
12	Fazoda Ikki tekislik orasidagi burchani topishni keltiring?	Fazoda uchta tekislikning o’zaro vaziyatini tushuntiring?	Oy o'qdan va x - y = 0, x+y-2z-1=0, 2x+z-4=0 tekisliklarning umumiy M0 nuqtasidan o'tuvchi tekislik tenglamasini toping.	2x-y+z -4=0, x +y - z - 2= 0, 2x - y + 3z - 6 = 0 tekisliklar bir nuqtada kesishishini ko'rsating va bu nuqtaning koordinatalarini toping.	x - y = 0, x+y -2z +1= 0, 2x + z -4 = 0 tekisliklarning kesishgan nuqtasi hamda M(2,1,7) va O(0,0,0) nuqtalardan o'tgan tekislikning tenglamasini toping.