QARSHI DAVLAT TEXNIKA UNIVERSITETI

"**Chiziqli algebra**" fanidan Yakuniy nazorat savollari barcha yo'nalish talabalari uchun

1. Asosiy ta'rif va tushunchalar. Matritsalarning turlari. Matritsalarni songa ko'paytirish, matritsalarni qo'shish, matritsalarni ayirish va matritsani matritsaga ko'paytirish amallari
2. Birinchi va ikkinchi va uchinchi tartibli determinantlar va ularni hisoblash usullari.
3. Determinantlarda O'rin almashtirishlar. *n*-taratibli determinantning ta'rifi
4. Determinantning asosiy xossalari. Minor va algebraik to'ldiruvchi tushunchalari.
5. Tekislikda va fazoda vektor tushunchalari. Vektorning matritsiyaviy ko'rinishi
6. Matritsalarni ko'paytirish.
7. Teskari matritsa ta'rifi. Xos va xosmas matritsalar.
8. Chiziqli algebraik tenglamalar sistemasini yechishning Kramer usuli
9. Chiziqli algebraik tenglamalar sistemasini yechishning Gauss usuli
10. Determinantning asosiy xossalari. Minor va algebraik to'ldiruvchi tushunchalari
11. Determinantlarda O'rin almashtirishlar. *n*-taratibli determinantning ta'rifi.
12. Chiziqli algebraik tenglamalar sistemasini taqribiy yechishning oddiy itiratsiya va Zedel usullari.
13. Matritsalarning xossalari.
14. Kvadratik formaning tarifi. Kvadratik formaning kanonik ko'rinishi.
15. Bir jinsli chiziqli algebraik tenglamalar sistemasining notrivial yechimi mavjudlik sharti.
16. *n* o'lchovli vektorlar va ular ustida arifmetik amallar.
17. Determinantlar va ularni hisoblash usullari.
18. Chiziqli algebraik tenglamalari sistemasini taqribiy yechish usullari.
19. Matritsalarni LU ko'paytmaga yoyish va ularning tatbiqlari.
20. r jinsli va bir jinsli bo'lmagan chiziqli algebraik tenglamalar sistemalar yechimlari orasidagi bog'lanish.
21. Chiziqli algebraik tenglamalar sistemasini yechishning matritsa usuli
22. Matritsalarni songa ko'paytirish, matritsalarni qo'shish, matritsalarni ayirish va matritsani matritsaga ko'paytirish amallari
23. *n* o'lchovli arifmetik vektor fazo va unga misollar.
24. *n* o'lchovli vektorlar sistemasining rangi va bazisi.
25. Kvadratik formani kanonik ko'rinishiga keltirish.
26. $\vec{a}=\{-1;-3;2\},\vec{b}=\{2;2;-4\},\vec{c}=\{3;0;-5\}$ Vektorlar berilgan, $\vec{a}\vec{b}\vec{c}$ ko'paytmani hisoblang
27. A=$\begin{bmatrix}1 & -1 & 2\\ 2 & 3 & 4\\ -4 & 5 & 1\end{bmatrix}$, $B=\begin{bmatrix}3 & 4 & 1\\ 0 & 2 & 5\\ 1 & -1 & 4\end{bmatrix}$ $A*B$=?
28. Tenglamalar sistemasini Kramer usuli bilan yeching: $\begin{cases}x_1+2x_2-x_3=3\\ 2x_1-x_2+2x_3=-1\\ x_1+3x_2-x_3=6\end{cases}$
29. $A=\begin{bmatrix}3 & 4 & 2\\ 1 & 0 & 5\end{bmatrix}$, $B=\begin{bmatrix}2 & 0\\ 1 & 3\\ 0 & 5\end{bmatrix}$, $C=\begin{bmatrix}1 & 3\\ 0 & 4\end{bmatrix}$ $A*B-C^2$=?

30. $\begin{vmatrix} 2\cos^2 a/2 & \sin a & 1 \\ 2\cos^2 b/2 & \sin b & 1 \\ 1 & 0 & 1 \end{vmatrix}$ Determinantlarni 3-ustun elementlari bo'yicha yoyib, hisoblang:

31. $\vec{a}=\{1;-2;2\}, \vec{b}=\{2;2;-5\}$ vektorlar berilgan. Quyidagilarni toping: a) $\vec{a}\cdot\vec{b}$

32. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} x_1 + x_2 + x_3 = 2 \\ 3x_1 + 2x_2 + 2x_3 = 1 \\ 4x_1 + 3x_2 + 3x_3 = 4 \end{cases}$$

33. Berilgan kvadrat matritsaning determinantlari va ranglarini topilsin:

$$A = \begin{pmatrix} 2 & 3 & 4 & 0 \\ 1 & 5 & 7 & 0 \\ 3 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

34. Tenglamalar sistemasini Kramer usuli bilan yeching: $\begin{cases} 2x+3y+2z = 9 \\ x+2y-3z=14 \\ 3x+4y+z=16 \end{cases}$

35. Berilgan matritsa ustida talab qilingan amallani bajaring

$\begin{bmatrix} 7 & 0 \\ 3 & 1 \\ -1 & 2 \end{bmatrix}$ -3 $\begin{bmatrix} 2 & \sqrt{2} \\ 1 & -1 \\ -1 & 0 \end{bmatrix}$ + $\begin{bmatrix} 1 & \sqrt{18} \\ 4 & -5 \\ 3 & 1 \end{bmatrix}$ ni toping

36. $\begin{cases} 2x+3y+2z = 9 \\ x+2y-3z=14 \\ 3x+4y+z=16 \end{cases}$ Quyidagi tenglamalar sistemasini Kramer usulida yeching

37. Fazoda koordinatalari bilan berilgan ***a*=(**3, 4,−1**)** va ***b*=(**−5, 2, 6**)** vektorlarning ***a·b*** skalyar ko'paytmasini hisoblang.

38. Agar $|\bar{a}| = 2\sqrt{2}$, $|\bar{b}| = 4$ hamda ($\bar{a}$ ^ $\bar{b}$)= 135^0 bo'lsa, $(\vec{a}-\vec{b})^2$ hisoblansin

39. *A*=$\begin{bmatrix} 2 & 1 & -1 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$, *B*=$\begin{bmatrix} 1 & -1 \\ 0 & 1 \\ 1 & 0 \end{bmatrix}$ *A*B*

40.

Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching. $\begin{cases} 2x+y+4z+8t=-1 \\ x+3y-6z+2t=3 \\ 3x-2y+2z-2t=8 \\ 2x+y-2z=4 \end{cases}$

41. *A*=$\begin{bmatrix} 1 & 2 & -3 \\ 1 & 0 & 2 \\ 4 & 5 & 3 \end{bmatrix}$, *B*=$\begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}$, *C*=(2 0 5), *E*- birlik matritsa *A*B*C-3E*=?

42. ***a*=(**–2, 6, 3**)** vektorning |***a***| modulini hisoblang.

43. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} 2x+y+4z+8t=-1 \\ x+3y-6z+2t=3 \\ 3x-2y+2z-2t=8 \\ 2x+y-2z=4 \end{cases}$$

44. $A=\begin{pmatrix} 4 & 3 \\ 7 & 5 \end{pmatrix}$ $B=\begin{pmatrix} -28 & 93 \\ 38 & -126 \end{pmatrix}$ $C=\begin{pmatrix} 7 & 3 \\ 2 & 1 \end{pmatrix}$ $A*B*C=?$

45. ***a*=(**1,0,–1**)** va ***b*=(**1,–1, 0**)** vektorlar orasidagi φ burchakni toping.

46. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching. $\begin{cases} 3x+2y+z=5 \\ x+y-z=0 \\ 4x-y+5z=3 \end{cases}$

47. Matritsa ustida quydagi amallarni bajaring $\begin{pmatrix} 1 & 3 \\ 2 & 0 \\ 1 & -1 \end{pmatrix} * \begin{pmatrix} 1 & -2 & 3 \\ 5 & 4 & 0 \end{pmatrix} + \begin{pmatrix} -10 & -9 & 7 \\ 1 & 5 & 8 \\ -1 & -3 & 6 \end{pmatrix}$

48. ***a*=(**1,0,–1**)** va ***b*=(**3,0,–3**)** vektorlar orasidagi φ burchakni toping

49. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} 2x_1+x_2-x_3=5 \\ 3x_1-x_2+2x_3=-5 \\ 7x_1+x_2-x_3=10 \end{cases}$$

50. $\begin{pmatrix} 5 & 2 & -2 & 3 \\ 6 & 4 & -3 & 5 \\ 9 & 2 & -3 & 4 \\ 7 & 6 & -4 & 7 \end{pmatrix} * \begin{pmatrix} 2 & 2 & 2 & 2 \\ -1 & -5 & 3 & 11 \\ 16 & 24 & 8 & -8 \\ 8 & 16 & 0 & -16 \end{pmatrix} = ?$

51. ***a*=(** λ , 0, –1**)** va ***b*=(**1, –1, 0**)** vektorlar orasidagi burchak φ $=60^0$ bo'ladigan λ parametrning qiymatlar to'plamini toping.

52. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} x_1+x_2+x_3=2 \\ 3x_1+2x_2+2x_3=1 \\ 4x_1+3x_2+3x_3=4 \end{cases}$$

53. Quyidagi *A* va *B* matritsalarning *AB* va *BA* ko‘paytmalarini toping:

$$A=\begin{pmatrix} 2 & 3 \\ 1 & 0 \end{pmatrix}, \qquad B=\begin{pmatrix} -1 & 0 \\ 2 & 1 \end{pmatrix}$$

54. λ parametrning ***a*=(** λ–2, 3, –1**)** va ***b*=(** λ ,–4, 3**)** vektorlar ortogonal bo‘ladigan qiymatlar to'plamini toping.

55. Tenglamalar sistemasini Kramer usulida yeching. $\begin{cases} x_1+3x_2-4x_3=-1 \\ x_1-5x_2+x_3=7 \\ 2x_1+x_2-3x_3=3 \end{cases}$

56. Matritsaviy ko‘rinishdagi *AX*=*B* tenglamani yeching.

$$A=\begin{pmatrix} 2 & 3 \\ 5 & 4 \end{pmatrix}, \; X=\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}, \quad B=\begin{pmatrix} 18 \\ 31 \end{pmatrix}.$$

57. λ parametrning ***a*=(** λ+2, 3, –1**)** va ***b*=(** λ ,4, 3**)** vektorlar ortogonal bo‘ladigan qiymatlar to’plamini toping.

58. Tenglamalar sistemasini Kramer usulida yeching $\begin{cases} 3x_1 + x_2 - x_3 = 2 \\ 2x_1 - 3x_2 + x_3 = -1 \\ x_1 - x_2 + 2x_3 = 5 \end{cases}$

59. Quyidagi matritsalar rangini minorlar ajratish usuli bilan hisoblang:

$$A=\begin{pmatrix} 2 & -4 & 3 & 1 & 0 \\ 1 & -2 & 1 & -4 & 2 \\ 0 & 1 & -1 & 3 & 1 \\ 4 & -7 & 4 & -4 & 5 \end{pmatrix}$$

60. Agar |***a***|=4, |***b***|=5 va φ=30^0 bo‘lsa, |***a***×***b***|=?

61. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} 2x + y + 4z + 8t = -1 \\ x + 3y - 6z + 2t = 3 \\ 3x - 2y + 2z - 2t = 8 \\ 2x + y - 2z = 4 \end{cases}$$

62. Quyidagi matritsalar rangini minorlar ajratish usuli bilan hisoblang:

$$A=\begin{pmatrix} 0 & 2 & -4 \\ -1 & -4 & 5 \\ 3 & 1 & 7 \\ 0 & 5 & -10 \\ 2 & 3 & 0 \end{pmatrix}$$

63. Agar |***a***|=4, |***b***|=5 va ***a***·***b*** =10 bo‘lsa, |***a***×***b***|=?

64. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching $\begin{cases} 3x + 2y + z = 5 \\ x + y - z = 0 \\ 4x - y + 5z = 3 \end{cases}$

65. Quyidagi matritsalar rangini minorlar ajratish usuli bilan hisoblang: *A*=

$$\begin{pmatrix} 1 & 2 & 1 & 3 \\ 4 & -1 & -5 & -6 \\ 1 & -3 & -4 & -7 \\ 2 & 1 & -1 & 0 \end{pmatrix}$$

66. (2***a***+***b***)× (2***a***–***b***) ko‘paytmani hisoblang.

67. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching

$$\begin{cases} 2x_1 + x_2 - x_3 = 5 \\ 3x_1 - x_2 + 2x_3 = -5 \\ 7x_1 + x_2 - x_3 = 10 \end{cases}$$

68. Quyidagi matritsalar rangini elementar almashtirish usuli bilan hisoblang:

$$\begin{pmatrix} 1 & 2 & 1 & 3 & 4 \\ 3 & 4 & 2 & 6 & 8 \\ 1 & 2 & 1 & 8 & 4 \end{pmatrix}$$

69. ***a***=(0, –2, 3) va ***b***=(1, 4, 0) bo‘lsa, ***a***×***b*** =(*x*, *y*, *z*) vektorial ko‘paytmaning koordinatalarini toping

70. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} x_1 + x_2 + x_3 = 2 \\ 3x_1 + 2x_2 + 2x_3 = 1 \\ 4x_1 + 3x_2 + 3x_3 = 4 \end{cases}$$

71. Quyidagi matritsalar rangini elementar almashtirish usuli bilan hisoblang:

$$\begin{pmatrix} 1 & 0 & 2 & 0 & 0 \\ 0 & 1 & 0 & 2 & 0 \\ 2 & 0 & 4 & 0 & 0 \end{pmatrix}$$

72. ***a***=(0, –2, 3) va ***b***=(1, 4, 0) bo‘lsa, |***a***×***b***| = ?

73. Quyidagi tenglamalar sistemasini teskari matritsa usulida yeching.

$$\begin{cases} x_1 + x_2 - 2x_3 = -7 \\ 3x_1 - 3x_2 + x_3 = 12 \\ 5x_1 - x_2 - 4x_3 = -5 \end{cases}$$

74. Quyidagi matritsalar rangini elementar almashtirish usuli bilan hisoblang:

$$\begin{pmatrix} 1 & 0 & 2 & 0 & 0 \\ 0 & 1 & 0 & 2 & 0 \\ 2 & 0 & 4 & 0 & 0 \end{pmatrix}$$

75. α parametrning ***a***=(α, –6, –2) va ***b***=(4, 3, 1) vektorlar kollinear bo‘ladigan qiymatlar to’plamini toping.

76. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} x_1 - 3x_2 + 2x_3 + x_4 = 2 \\ 2x_1 + x_2 + 4x_3 + 3x_4 = 1 \\ x_1 + 5x_2 - x_3 + x_4 = -4 \\ 3x_1 - x_2 + 6x_3 + 5x_4 = 0 \end{cases}$$

77. Quyidagi matritsalar rangini elementar almashtirish usuli bilan hisoblang:

$$\begin{pmatrix} 4 & 3 & -5 & 2 & 3 \\ 8 & 6 & -7 & 4 & 2 \\ 4 & 3 & -8 & 2 & 7 \\ 4 & 3 & 1 & 2 & -5 \\ 8 & 6 & -1 & 4 & -6 \end{pmatrix}$$

78. α parametrning ***a***=(α, –6, –2) va ***b***=(4, 3, α) vektorlar kollinear bo‘ladigan qiymatlar to’plamini toping.

79. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} 2x_1 + x_2 + 3x_3 - 4x_4 = 3 \\ x_1 - 2x_2 + x_3 - 3x_4 = -1 \\ 3x_1 + 4x_2 - 5x_3 + x_4 = 4 \\ 2x_1 - 4x_2 + 2x_3 - 6x_4 = 5 \end{cases}$$

80. Quyidagi matritsalar rangini elementar almashtirish usuli bilan hisoblang:

$$\begin{pmatrix} 24 & 19 & 36 & 72 & -38 \\ 49 & 40 & 73 & 147 & -80 \\ 73 & 59 & 98 & 219 & -118 \\ 47 & 36 & 71 & 141 & -72 \end{pmatrix}$$

81. ***a***=(0, –2, 3) va ***b***=(1, 4, 0) vektorlardan yasalgan parallelogramm yuzasi hisoblansin.

82. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} 3x_1 - 2x_2 - 5x_3 + x_4 = 3 \\ 2x_1 - 3x_2 + x_3 + 5x_4 = -3 \\ x_1 + 2x_2 - x_3 - 4x_4 = -1 \\ x_1 - x_2 - 4x_3 + 9x_4 = 22 \end{cases}$$

83. Tengsizliklarni yeching: $\begin{vmatrix} x & 1 \\ -4 & x \end{vmatrix} \le \begin{vmatrix} 5 & 2 \\ 1 & x \end{vmatrix}$

84. Quyidagi matritsalar rangini elementar almashtirish usuli bilan hisoblang:

$$\begin{pmatrix} 24 & 19 & 36 & 72 & -38 \\ 49 & 40 & 73 & 147 & -80 \\ 73 & 59 & 98 & 219 & -118 \\ 47 & 36 & 71 & 141 & -72 \end{pmatrix}$$

85. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} x_1 + 2x_2 + x_3 = 8 \\ x_2 + 3x_3 + x_4 = 15 \\ 4x_1 + x_3 + x_4 = 11 \\ x_1 + x_2 + 5x_4 = 23 \end{cases}$$

86. Determinantlarni 3-ustun elementlari bo'yicha yoyib, hisoblang:

$$\begin{vmatrix} 1+\cos a & 1+\sin a & 1 \\ 1-\sin a & 1+\cos a & 1 \\ 1 & 1 & 1 \end{vmatrix}$$

87.

a=(0, –2, 4) va ***b***=(2, 4, 0) vektorlardan yasalgan ucburchak yuzasi hisoblansin.

88. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} -x_1 + x_2 + x_3 - x_4 = -2 \\ x_1 + 2x_2 - 2x_3 - x_4 = -5 \\ 2x_1 - x_2 - 3x_3 + 2x_4 = -1 \\ x_1 + 2x_2 + 3x_3 - 6x_4 = -10 \end{cases}$$

89. $\begin{vmatrix} 2\cos^2 a/2 & \sin a & 1 \\ 2\cos^2 b/2 & \sin b & 1 \\ 1 & 0 & 1 \end{vmatrix}$ Determinantlarni 3-ustun elementlari bo'yicha yoyib, hisoblang

90. ***a***, ***b*** va ***c*** vektorlar o'zaro perpendikulyar va |***a***|=6, |***b***|=3 va |***c***|=4 bo'lsa, ***abc*** aralash ko'paytma qiymatini hisoblang.

91. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} 4x_1 - 3x_2 + x_3 + 5x_4 - 7 = 0 \\ x_1 - 2x_2 - 2x_3 - 3x_4 - 3 = 0 \\ 3x_1 - x_2 + 2x_3 + 3x_4 - 2 = 0 \\ 2x_1 + 3x_2 + 2x_3 - 8x_4 + 7 = 0 \end{cases}$$

92. Qanday shart bajarilganda quyidagi tenglik o'rinli bo'ladi?

$$\begin{vmatrix} 1 & \cos a & \cos b \\ \cos a & 1 & \cos y \\ \cos b & \cos y & 1 \end{vmatrix} = \begin{vmatrix} 0 & \cos a & \cos b \\ \cos a & 0 & \cos y \\ \cos b & \cos y & 0 \end{vmatrix}$$

93. X=(***a***+***b***)(***b***+***c***) (***c***+***a***) aralash ko'paytma ifodasini soddlashtiring

94. Tenglamalar sistemasini Kramer usulida yeching

$$\begin{cases} 3x_1 + x_2 - x_3 = 2 \\ 2x_1 - 3x_2 + x_3 = -1 \\ x_1 - x_2 + 2x_3 = 5 \end{cases}$$

95. Berilgan matritsa ustida talab qilingan amallani bajaring.

$A=\begin{bmatrix} 1 & 5 \\ 2 & -4 \end{bmatrix}$ $B=\begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix}$ *2A-B*=?

96. Agar λ va μ ixtiyoriy sonlar bo'lsa, X=***ab***(***c***+ λ***a***+μ***b***) aralash kopaytma ifodasini soddalashtiring.

97. Tenglamalar sistemasini Kramer usulida yeching. $\begin{cases} x_1 + 3x_2 - 4x_3 = -1 \\ x_1 - 5x_2 + x_3 = 7 \\ 2x_1 + x_2 - 3x_3 = 3 \end{cases}$

98. *C*= (1 2 3), $F=\begin{bmatrix} 4 & -3 \\ 1 & 2 \\ 0 & 2 \end{bmatrix}$ *C**F*=?

99. Koordinatalari bilan berilgan ***a***=(2,–3,1), ***b***=(1,0,4) va ***c***=(5,–2,0) vektorlarning aralash ko'paytmasi ***abc*** hisoblansin.

100. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} x_1 - 3x_2 + 2x_3 + x_4 = 2 \\ 2x_1 + x_2 + 4x_3 + 3x_4 = 1 \\ x_1 + 5x_2 - x_3 + x_4 = -4 \\ 3x_1 - x_2 + 6x_3 + 5x_4 = 0 \end{cases}$$

101. $A=\begin{bmatrix} 1 & 1 & 2 \\ 1 & 3 & 1 \\ 4 & 1 & 1 \end{bmatrix}$, *E*-birlik matritsa $2A^2+3A+5E$ =?

102. ***a***, ***b*** va ***c*** vektorlar o'zaro perpendikulyar va |***a***|=4, |***b***|=5 va |***c***|=3 bo'lsa, ularga yasalgan parallelepiped hajmini hisoblang**.** .

103. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} 2x_1 + x_2 + 3x_3 - 4x_4 = 3 \\ x_1 - 2x_2 + x_3 - 3x_4 = -1 \\ 3x_1 + 4x_2 - 5x_3 + x_4 = 4 \\ 2x_1 - 4x_2 + 2x_3 - 6x_4 = 5 \end{cases}$$

104. Matritsaviy ko‘rinishdagi $AX=B$ tenglamani yeching. $A=\begin{pmatrix} 2 & 3 \\ 5 & 4 \end{pmatrix}$, $X=\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$, $B=\begin{pmatrix} 18 \\ 31 \end{pmatrix}$.

105. ***a***=(1,1,0), ***b***=(1,0,1) va ***c***=(0,1,1) vektorlarga yasalgan parallelepiped hajmini hisoblang.

106. Tenglamalar sistemasini Kramer usulida yeching. $\begin{cases} x_1 + 3x_2 - 4x_3 = -1 \\ x_1 - 5x_2 + x_3 = 7 \\ 2x_1 + x_2 - 3x_3 = 3 \end{cases}$

107. Berilgan kvadrat matritsaning determinantlari va ranglarini topilsin

$$A=\begin{pmatrix} -1 & 0 & 8 \\ 5 & 9 & 0 \\ 0 & 4 & 3 \end{pmatrix}$$

108. ***a***=(3,2,1), ***b***=(1,–3,2) va ***c***=(–1,1,0) vektorlarga yasalgan piramida hajmini hisoblang.

109. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} 3x_1 - 2x_2 - 5x_3 + x_4 = 3 \\ 2x_1 - 3x_2 + x_3 + 5x_4 = -3 \\ x_1 + 2x_2 - x_3 - 4x_4 = -1 \\ x_1 - x_2 - 4x_3 + 9x_4 = 22 \end{cases}$$

110. $A=\begin{bmatrix} 1 & -1 & -3 \\ 2 & 1 & 5 \end{bmatrix}$ $B=\begin{bmatrix} 0 & 3 & 2 \\ -1 & 4 & 1 \end{bmatrix}$ *5A-4B*=?

111. R^4 vektor fazoda ***y***=(3,–2,1,4) va 3***x***+***y*** =(6,4,1,13) bo‘lsa, ***x*** vektorni toping.

112. Quyidagi tenglamalar sistemasini Gauss usuli bilan yeching:

$$\begin{cases} -x_1 + x_2 + x_3 - x_4 = -2 \\ x_1 + 2x_2 - 2x_3 - x_4 = -5 \\ 2x_1 - x_2 - 3x_3 + 2x_4 = -1 \\ x_1 + 2x_2 + 3x_3 - 6x_4 = -10 \end{cases}$$

113. $A=\begin{bmatrix} 1 & 2 & -3 \\ 1 & 0 & 2 \\ 4 & 5 & 3 \end{bmatrix}$, $B=\begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}$, *C*=(2 0 5), *E*- birlik matritsa *A*B*C-3E*=?

114. ***x***=(1, 4, –1) vektorni $\boldsymbol{e}_1$=(1, 1, 0) , $\boldsymbol{e}_2$=(1, 0, 1) va $\boldsymbol{e}_3$=(0, 1, 1) bazisdagi yoyilmasini toping.

115. Tenglamalar sistemasini Kramer usulida yeching. $\begin{cases} x_1 + 3x_2 - 4x_3 = -1 \\ x_1 - 5x_2 + x_3 = 7 \\ 2x_1 + x_2 - 3x_3 = 3 \end{cases}$

116.