

60730600- Gidrotexnika va geotexnika muhandisligi ta'lim yo'nalishi 1-kurs
talabalari uchun “*Oliy matematika*” fanidan yakuniy nazorat savollari.

(2024-2025 o'.y. 1-semestr)

Nazariy savollar

1. Uchinchi ta'rtibli determinantni hisoblashning uchburchak usulini yozing.
2. Determinant so'zining ma'nosi.
3. Teskari matritsani hisoblash formulasini yozing.
4. A matrisasining teskari matritsasi bor bo'lishi uchun qaysi shart o'rinli bo'lishi kerak.
5. Algebraik to'ldiruvchi formulasini.
6. Tenglamalar sistemasini yeshishning Kramer usuli.
7. Ikki vektorning skalyar ko'paytmasi.
8. Ikkinchi ta'rtpili chiziqlarning umumiy tenglamasini yozing.
9. To'g'ri chiziqning burchak koefficienti tenglamasini yozing.
10. Nuqtadan to'g'ri chiziqqacha oraliqni topish formulasini yozing.
11. Aylananing umumiy tenglamasi.
12. Ellipsning kanonik tenglamasini yozing.
13. Giperbolaning kanonik tenglamasini yozing.
14. Parabolaning kanonik tenglamasini yozing.
15. Ellipsning eksentrisentin va direktrisasini hisoblash formulalarini yozing.
16. Giperbolaning eksentrisentin va direktrisasini hisoblash formulasini yozing.
17. Uch vektorning aralash ko'paytmasini hisoblash formulasini yozing.
18. To'g'ri chiziqning parallellik sha'rtini ko'rsating.
19. Bir to'g'ri chiziqta yoki parallel to'g'ri chiziqlarda yotgan vektorlar deyiladi.
20. $y = k_1x + b_1$ va $y = k_2x + b_2$ to'g'rilarning perpendikulyar bo'lish sha'rti qanday?
21. Qutb koordinatalar sistemasidan Dekart koordinatalar sistemasiga o'tish formulasini yozing.
22. Uch vektorning aralash ko'paytmasi.
23. To'g'ri chiziqning umumiy tenglamasini yozing.
24. Nuqtadan tekislikkacha oraliqni hisoblash formulasini yozing.
25. Ikkinchi tartibli sirtning umumiy tenglamasi.
26. Funksiyada argumentining qabul qilishi mu'mkin bo'lgan qiymatlar to'plami ... deyiladi.
27. e sonini ifodalovchi limitning formulasini ko'rsating.
28. Birinchi ajoyib limit formulasini yozing.

29. Funkciyaning differenciali.
30. Ko'paytmaning hosilasini hisoblash formulasini yozing.
31. Bo'linmaning hosilasi.
32. Urinma tenglamasi.
33. Taqribiy hisoblash formulasi.
34. $f(x)$ funksiya x_0 nuqtada u'zluksiz bo'lish uchun qaysi sha'rt orinli boladi.
35. $(f(x) \pm g(x))' = ?$
36. Vektorning uzunligini hisoblash formulasini yozing.
37. Uzilishga ega bo'lgan funksiyalar nechta turga bo'linadi.
38. Lopital qoidasini yozing.
39. Vektorlarning komplanarlik shartini yozing..
40. Vektorning komplanarlik shartini yozing.

Amaliy ahamiyatga ega savollar

41. Determinantni hisoblang.

$$\begin{vmatrix} 2 & 3 & -1 \\ -4 & -1 & -3 \\ 1 & 4 & 2 \end{vmatrix}$$
42.
$$\begin{vmatrix} 0 & -2 & 1 \\ 3 & 4 & 3 \\ 2 & -3 & -2 \end{vmatrix}$$
43.
$$\begin{vmatrix} 0 & 4 & 2 \\ 1 & 0 & 3 \\ 3 & -3 & -1 \end{vmatrix}$$
44.
$$\begin{vmatrix} 1 & 3 & -2 \\ -3 & 1 & -4 \\ 0 & 6 & 4 \end{vmatrix}$$
45.
$$\begin{vmatrix} 1 & -4 & 0 \\ -4 & 3 & 2 \\ -2 & 3 & -1 \end{vmatrix}$$
46. Tenglamalar sistemasini yeching.

$$\begin{cases} 3x + 2y + z = 5 \\ 2x + 3y + z = 1 \\ 2x + y + 3z = 11 \end{cases}$$
47.
$$\begin{cases} x - 2y - z = 6 \\ 2x + 3y + 5z = 11 \\ 3x + 5y + 4z = 8 \end{cases}$$

$$48. \begin{cases} 4x - 3y + 2z = 9 \\ 2x + 5y - 3z = 4 \\ 5x + 6y + 2z = 18 \end{cases}$$

$$49. \begin{cases} x + y - z = 7 \\ 2x + 8y + 5z = 15 \\ 3x + 9y + 4z = 10 \end{cases}$$

$$50. \begin{cases} 2x - y - z = 4 \\ 3x + 4y - 2z = 11 \\ 3x - 2y + 4z = 11 \end{cases}$$

$$51. \begin{cases} 4x + 6y + 3z = 17 \\ 2x + 6y + 5z = 12 \\ 3x + 6y + 4z = 9 \end{cases}$$

52.

53. Agar $|\vec{a}| = 2$, $|\vec{b}| = 3$ bo'lib, ular o'zaro $\varphi = 60^\circ$ li burchak hosil qilsa, $\vec{a}$ va $\vec{b}$ vektorlarining skalyar ko'paytmasini toping.

54. Agar $|\vec{a}| = 3$, $|\vec{b}| = 4$ bo'lib, ular o'zaro $\varphi = 60^\circ$ li burchak hosil qilsa, $\vec{a}$ va $\vec{b}$ vektorlarining skalyar ko'paytmasini toping.

55. Agar $|\vec{a}| = 4$, $|\vec{b}| = 5$ bo'lib, ular o'zaro $\varphi = 45^\circ$ li burchak hosil qilsa, $\vec{a}$ va $\vec{b}$ vektorlarining skalyar ko'paytmasini toping.

56. Agar $|\vec{a}| = 7$, $|\vec{b}| = 2$ bo'lib, ular o'zaro $\varphi = 45^\circ$ li burchak hosil qilsa, $\vec{a}$ va $\vec{b}$ vektorlarining skalyar ko'paytmasini toping.

57. Agar $|\vec{a}| = 5$, $|\vec{b}| = 3$ bo'lib, ular o'zaro $\varphi = 30^\circ$ li burchak hosil qilsa, $\vec{a}$ va $\vec{b}$ vektorlarining skalyar ko'paytmasini toping.

58. $M_1(3, 1, -2)$, $M_2(4, -1, -1)$ va $M_3(2, 0, 2)$ nuqtalardan o'tuvchi tekislik tenglamasini tuzing.

59. $M_1(1, 0, -2)$, $M_2(4, -1, -1)$ va $M_3(1, -1, 5)$ nuqtalardan o'tuvchi tekislik tenglamasini tuzing.

60. $M_1(3, 1, -2)$, $M_2(2, 1, -1)$ va $M_3(1, 5, 2)$ nuqtalardan o'tuvchi tekislik tenglamasini tuzing.

61. $M_1(3, 3, -2)$, $M_2(0, 1, 1)$ va $M_3(2, 0, 2)$ nuqtalardan o'tuvchi tekislik tenglamasini tuzing.

62. $M_1(-3, 5, 0)$, $M_2(5, -3, 7)$ va $M_3(3, 0, 7)$ nuqtalardan o'tuvchi tekislik tenglamasini tuzing.

63. Limitni hisoblang.

$$\lim_{x \rightarrow 2} \frac{2x^2 - 7x + 6}{x^3 - 8}$$

$$64. \lim_{x \rightarrow 3} \frac{2x^2 - 7x + 3}{x^3 - 27}$$

65. $\lim_{x \rightarrow -1} \frac{7x^2 + 4x - 3}{5x^2 + 4x - 1}$
66. $\lim_{x \rightarrow 5} \frac{3x^2 - 6x - 45}{x^2 - 2x - 15}$
67. $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$ limiti esaplañ.
68. Limitti esaplañ: $\lim_{x \rightarrow 0} \frac{\arcsin 5x}{x}$
69. Funkciyaning hosilasini hisoblang.
 $y = x^2 \sin 2x$
70. $y = e^{4x} \operatorname{tg} 2x$
71. $y = (x^2 + 1)^{\operatorname{ctg} 2x}$
72. $y = \frac{\sqrt{x^2 - 2}}{x^3 + 7}$
73. $y = \lg^4(x^5 - \sin^4 2x)$
74. Agar $f(x) = x^2 \cos^3 x$ bo'lsa unda $f'(2\pi) = ?$
75. $M_1(3,1)$ va $M_2(2,0)$ nuqtalardan o'tuvchi to'g'ri chiziq tenglamasini tuzing.
76. Limitni hisoblang: $\lim_{n \rightarrow 2} \frac{n^2 - 3n + 2}{n - 2}$
77. $\frac{x^2}{64} + \frac{y^2}{36} = 1$ ellipsning eksentrisitetini toping
78. $\frac{x-1}{1} = \frac{y+1}{-2}$ va $2x + 3y - 1 = 0$ to'g'ri chiziqlarning kesilish nuqtasini toping.
79. Agar $f(x) = \frac{3\sqrt{x}}{3-x}$ funktsiyasi berilgan bo'lsa $f'(1)$ ni toping.
80. $9x^2 + 25y^2 = 225$ ellips berilgan, ellipsning fokuslarini toping.
81. Katta o'qi 3 ga, fokusi $F(\sqrt{5}, 0)$ nuqtada bo'lgan ellipsning tenglamasini toping.
82. $y = x^3 \operatorname{ctg}^3 x$ funktsiyasining hosilasini toping.
83. $u = xe^x$ funktsiyasining hosilasini toping.
84. $y = \ln \frac{1-x}{1+x}$ funktsiyani juft, toqlikka tekshiring.
85. $y = \operatorname{arctg} \sqrt{1+x^2}$ funkciyaning hosilasini toping.
86. $y = \cos(x^2 - 1)$ juft, toqlikka tekshiring.
87. $y = \ln(x + \sqrt{1+x^2})$ juft, toqlikka tekshiring
88. $y = \ln \operatorname{tg} \sqrt{x}$ funkciyaning hosilasini toping.

89. $f(x) = \frac{x+5}{x^2-9}$ funktsiyasining hosilasini toping.

90. Aniqlanish sohasini toping:

$$f(x) = \sqrt{x^2 - 4} + \sqrt{9 - x^2}$$

91. $\int x e^{-5x} dx$ integralni hisoblang

92. $\int \frac{1}{x^3+x} dx$ integralni hisoblang

93. $\int \frac{3x+4}{\sqrt{6x-x^2-8}} dx$ integralni hisoblang

94. $\int \sqrt[3]{x} (2 + \sqrt{x})^2 dx$ integralni hisoblang

95. $\int \frac{dx}{(3x-4)^5}$ integralni hisoblang

96. $\int 3^x \cdot e^{3x} dx$ integralni hisoblang

97. $\int \frac{x - \arcsin x}{\sqrt{1-x^2}} dx$ integralni hisoblang

98. $\int \frac{dx}{4\sin x + 3\cos x + 5}$ integralni hisoblang

99. $\int \sin^4 x dx$ integralni hisoblang

100. $\int \frac{dx}{\sqrt{x^2+2x+5}}$ integralni hisoblang