MATEMATIKA-2019
(HARBIY)

1. Agar a va b natural son uchun $a^2 - b^2 = 49$ o'rinli bo'lsa, $3a - 2b = ?$
2. $\int x^3 \sin x^4 dx$
3. 1 dan 126 gacha bo'lgan natural sonlar orasida 2 ga ham, 7 ga ham bo'linmaydiganlari nechta?
4. Agar $xl = 9$ va $x + l = 7$ bo'lsa, $(4 - x^2)l + (4 - l^2)x = ?$
5. Soddalashtiring.
$$5\left(4a - \left(3a - (2a - b)\right)\right)$$
6. Agar qo'shni burchaklar o'zaro 13:17 nisbatda bo'lsa, shu burchaklarning kattasini toping.
7. Agar $\sin\alpha\cos\alpha = -0,25$ va $1,6 < \alpha < 3,1$ bo'lsa, $\cos\alpha - \sin\alpha = ?$
8. 0,1,2,3,4,5,6 raqamlaridan foydalanib jami nechta uch xonali son hosil qilish mumkin?
9. $\{a; b; c; d; e; f\}$ to'plamning c va d elementlari qatnashmaydigan nechta qism to'plamlari mavjud?
10. O'nbirburchakli prizmaning nechta turli diagonal kesimi mavjud?
11. Oltiburchakli prizmaning nechta turli diagonal kesimi mavjud?
12. $\int x^2 \cos x^3 dx$
13. 433^{433} sonini 5 ga bo'lgandagi qoldiqni toping.
14. C nuqta AB kesmani $BC:AC = 4:3$, D nuqta esa AC kesmani $AD:DC = 5:3$ nisbatda bo'ladi. Agar AB kesmaning uzunligi 56 bo'lsa, u holda $DC = ?$
15. 0,1,2,3,4 raqamlaridan foydalanib jami nechta uch xonali son hosil qilish mumkin?
16. $\frac{36 - x^2}{6x^{-2} - x^{-1}} \geq 0$ [3; 9] oraliqdagi yechimlarining o'rta arifmetigini toping.
17. $\frac{\sin(2x+y) + \sin(2x-y)}{\sin(2x-y) - \sin(2x+y)} - \frac{tgy - tg2x}{tgy}$
18. Agar $\sin\alpha\cos\alpha = -0,345$ va $1,6 < \alpha < 3,1$ bo'lsa, $-\cos\alpha + \sin\alpha$ ni toping.
19. $\int(x^3 - \cos 4x)dx$

20. $xy = -2$ $x + y = 3$ $(5 - 3x)^2 y + (5 - 3y)^2 x = ?$
21. $\frac{\sqrt{13} - 4}{\sqrt{\sqrt{13} - 3} + 1} - \frac{\sqrt{13} - 12}{\sqrt{\sqrt{13} - 3} - 3}$ irratsionallikdan qutqaring.
22. Agar $16 - 3\left(2x - 3\left(2 - 3(1 - 3x)\right)\right) = 82$ tenglamaning ildizi x_0 bo'lsa, $x_0^2 - 6$ ning qiymatini toping.
23. $\begin{cases} \frac{ab}{a+b} = -3 \\ \frac{ac}{a+c} = 2\frac{2}{3} \\ \frac{bc}{b+c} = -4 \end{cases}$ $-a - b + c = ?$
24. ABCD trapetsiyaning asoslari 27 va 48 ga teng. AC diagonal o'tkazildi. Yon tomoni va diagonal orasidagi burchak trapetsiyaning boshqa o'tkir burchagiga teng. Diagonalni toping.
25. $y = \frac{2}{x} - 3$ funksiyaning qiymatlar sohasini toping.
26. 1234 ... 110111 sonni hosil qilishda nechta raqam ishtirok etgan.
27. $-1 + 2 - 3 + 4 - 5 + \cdots + 198 - 199 = ?$
28. Silindr asosining aylanasiga o'tkazilgan vatar $60°$li yoyni tortib turadi. Vatar uzunligi 3 ga teng. Silindr hajmini toping.
29. $\vec{a}(-1; 2), \vec{b}(-2; 1), \vec{c}(-3; 2)$ vektorlar berilgan. $2\vec{a} - k\vec{b}$ va $\vec{c}$ perpendikulyar bo'lsa, k ning qiymatini toping.
30. $\frac{x^2 - 121}{-11x^{-2} + x^{-1}} \geq 0$ $(3; 12)$ oraliqdagi yechimlarining o'rta arifmetigini toping.
31. $\frac{\sqrt{11} - 3}{\sqrt{\sqrt{11} - 3} - 1} - \frac{\sqrt{11} - 12}{\sqrt{\sqrt{11} - 3} - 3}$ irratsionallikdan qutqaring.
32. $f(x) = \frac{x^3 - 8}{x^2 - 2x + 4}$ $x = 0$ nuqtadagi hosilasini toping.
33. $y = \frac{3}{x} - 4$ funksiyaning aniqlanish sohasini toping.
34. $S_n = n^2 + 9n$ $a_{20} = ?$
35. $x^{lgx} = 1000$ tenglamani yeching.
36. $\sin 3\alpha \cos^2 \alpha + \cos 3\alpha \sin^2 \alpha = x$
37. $25_6 + 27_8 - 103_4 = x_7$ $x = ?$
38. Agar qo'shni burchaklar o'zaro 11:19 nisbatda bo'lsa, shu burchaklarning kichigini toping.

39. $\frac{x^2-49}{-7x^{-2}+x^{-1}} \leq 0$ [2; 9] oraliqdagi yechimlarining o'rta arifmetigini toping.

40. $a > 1$ bo'lsa, quyidagilardan qaysi biri ma'noga ega emas?

A)$log_a log_a lg 5$ B)$log_a log_a(a+1)$
C)$lg log_a lg 5$

41. $\frac{sin(4x+y)+sin(4x-y)}{sin(4x-y)-sin(4x+y)} - \frac{tgy-tg4x}{tgy}$

42. $\frac{\sqrt{23}-4}{\sqrt{\sqrt{23}-3}+1} - \frac{\sqrt{23}-12}{\sqrt{\sqrt{23}-3}-3}$

43. $14_4 + 41_4 + x_4 = 45_8$ $x =?$

44. $-1 + 2 - 3 + 4 - \cdots + 288 - 289 =?$

45. $1:3000000$ masshtabli xaritada yo'lning uzunligi 24 sm ga teng bo'lsa, $1:5000000$ masshtabli xaritada yo'lning uzunligi necha dm ga teng.

46. $sin2x + cos2x = 2tgx + 1$ tenglamani yeching.

47. $\int_1^2 e^{-4lnx}dx =?$

48. $\int lnsinx^{cosx}dx =?$

49. $103_4 + 210_5 =?$

50. $4^{lgx} \cdot 2^{lgx} = 64$ bo'lsa, $x =?$

51. $lgx = 0,12$ bo'lsa, x^{50} necha xonali son?

52. $1:4000000$ masshtabli xaritada ikki shahar orasidagi masofa 1,2 dm ga teng. Shaharlar orasidagi masofa necha km ga teng?

53. ABCD trapetsiya asoslari 8 va 32 ga teng. $\angle ADC = \angle BAC$ bo'lsa, AC diagonalni toping.

54. Bir nechta natural sonlarning yig'indisi 44 ga teng. Agar shu sonlarning har biri 2 ga orttirilib yig'indi hisoblansa 62 ga teng bo'ldi, dastlab yig'indida nechta son qatnashgan.

55. $x^4 \cdot 2^x + 8 > 8x^4 + 2^x$ tengsizlikni yeching.

56. 1 dan 200 gacha bo'lgan natural sonlar ichida 5 ga ham, 7 ga ham bo'linmaydiganlari nechta?

57. Agar a va b natural son uchun $a^2 - b^2 = 25$ o'rinli bo'lsa, $2a - b =?$

58. $\int_0^2 xe^{x^2}dx$

59. Trapetsiyaning bir diagonali 13, ikkinchi diagonali $\sqrt{125}$ ga, balandligi 5 ga teng bo'lsa, yuzini toping.

60. 324, 255 va 71 sonlarining har birini qanday natural songa bo'lganda qoldiqlari bir xil qoladi?

61. $\frac{1}{a(a-b)(a-c)} + \frac{1}{b(b-a)(b-c)} + \frac{1}{c(c-a)(c-b)}$ ifodani soddalashtiring.

62. Arifmetik progressiyada dastlabki 20 ta hadi yig'indisi 400 ga, dastlabki 30 ta hadi yig'indisi esa900 ga teng. Dastlabki 50 hadi yig'indisini toping.

63. $y = arccos2^x$ funksiyaning aniqlanish sohasini toping.

64. $arccosx < arcsinx$ tengsizlikni yeching.

65. $a_1 = 1$ $S_{20} - S_{12} = 380$ $d =?$

66. $cos(12arctgx) = 1$ tenglama nechta yechimga ega?

67. $EKUB(x; 4) = 1$ bo'lsa, $\left[\frac{x}{4}\right] + \left[\frac{2x}{4}\right] + \left[\frac{3x}{4}\right] = 9$ tenglama nechta ildizga ega?

68. $2^{|x+2|} > 16$ tengsizlikni yeching.

69. $\begin{cases} 3^x 5^y = 75 \\ 3^y 5^x = 45 \end{cases}$ tenglamalar sistemasini yeching.

70. $log_4 125 = a$ $lg64 =?$

71. $xlog_2 x = 24$ tenglamani yeching.

72. $(0,3)^{2+4+6+\cdots+2x} > (0,3)^{72}$

73. $f(x) + 2f\left(\frac{1}{x}\right) = x$ bo'lsa, $f(x) =?$

74. $16sin10°sin30°sin50°sin70°sin90°$ hisoblang.

75. $S_n = n^3 + 2n^2$ $a_{10} =?$

76. Ko'pyoqning yoqlari soni 7 ta, uchlari soni 6 ta bo'lsa, qirralari sonini toping.

77. Funksiyaning aniqlanish sohasini toping. $f(x) = \frac{5}{x} - \sqrt{\frac{x-2}{x(x+3)}}$

78. $sin2x + cos2x = 2tgx + 1$ tenglamani yeching.

79. $lgx = 0,52$ x^{100} necha xonali son?

80. $cos\alpha = -\sqrt{0,2}$ bo'lsa, $sin\left(\frac{3\pi}{2} - 2\alpha\right)$