Matematik analiz fanidan yakuniy nazorat savollari bazasi

1. Parametrga bog‘liq xos integrallar va ularning funksional xossalari.
2. Parametrga bog‘liq xosmas integrallarni tekis yaqinlashishi va ularning funksional xossalari.
3. Gamma va Beta funksiyalar va ularning xossalari, ular orasidagi bog‘lanish.
4. Gamma va Beta funksiyalar va ularning xossalari, ular orasidagi bog‘lanish.
5. Ikki karali integral. Darbu yig‘indilari va ularning xossalari. Karrali integrallarning mavjudligi. Integrallanuvchi funksiyalar sinfi.
6. Ikki karali integral. Darbu yig‘indilari va ularning xossalari. Karrali integrallarning mavjudligi. Integrallanuvchi funksiyalar sinfi.
7. Karrali integrallarni hisoblash. Karrali integrallarni hisoblashda o‘zgaruvchini almashtirish usuli.
8. Karrali integrallarni hisoblash. Karrali integrallarni hisoblashda o‘zgaruvchini almashtirish usuli.
9. Uch karrali integral. Uch karrali integralni hisoblash. Uch karrali integrallarda o‘zgaruvchlarni almashtirish. Karrali integrallarning tadbiqlari.
10. Uch karrali integral. Uch karrali integralni hisoblash. Uch karrali integrallarda o‘zgaruvchlarni almashtirish. Karrali integrallarning tadbiqlari.
11. Karrali xosmas integrallar. Karrali xosmas integralning bosh qiymati.
12. Karrali xosmas integrallar. Karrali xosmas integralning bosh qiymati.
13. Birinchi tur egri chiziqli integral. Ikkinchi tur egri chiziqli integral.
14. Birinchi tur egri chiziqli integral. Ikkinchi tur egri chiziqli integral.
15. Grin formulasi. Grin formulasining tadbiqlari.
16. Grin formulasi. Grin formulasining tadbiqlari.
17. Sirt tushunchasi. Sirt yuzasi. Birinchi tur sirt integrali. Ikkinchi tur sirt integrali.
18. Sirt tushunchasi. Sirt yuzasi. Birinchi tur sirt integrali. Ikkinchi tur sirt integrali.
19. Birinchi va ikkinchi tur sirt integrallari orasidagi bog‘lanish. Stoks formulasi. Ostrogradskiy formulasi.
20. Birinchi va ikkinchi tur sirt integrallari orasidagi bog‘lanish. Stoks formulasi. Ostrogradskiy formulasi.
21. Davriy funksiyalar. Funksiyalarni davriy davom ettirish. Fure qatori. Juft va toq funksiyalarning Fure qatori.
22. Dirixle integrali. Lokalizatsiyalash prinsipi. Fure qatorlarining yaqinlashishi. Feyer teoremasi. Bessel tengsizligi. Yaqinlashuvchi Fure qatorining funksional xossalari.

Misollar:

1. Integralni hisoblang. $\iint\limits_{(D)} (x^2+y^2)dxdy$, bunda (D)-tomonlari $y=x, y=x+a, y=a, y=3a\,(a>0)$ parallelogrammdan iborat.

2. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy+x+y)dx+(xy+x-y)dy, K: \frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

3. Integralni hisoblang. $\int\limits_{\breve{A}B} (x^{4/3}+y^{4/3})ds$, bunda AB - $x^{2/3}+y^{2/3}=1$ tenglama bilan berilgan egri chiziq.

4. Integralni hisoblang. $\iint\limits_{(D)} xy^2dxdy$, $(D)=\left\{(x,y)\in R^2, y^2=2px, x=\frac{p}{2}, (p>0)\right\}$.

5. Integralni hisoblang. $\int\limits_{\breve{A}B} \frac{1}{y^2}ds$, bunda AB - $y=ach\frac{x}{a}$ tenglama bilan berilgan egri chiziq.

6. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy+x+y)dx+(xy+x-y)dy, K:\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

7. Integralni hisoblang. $\iint\limits_{(D)} |xy|dxdy$, $(D)=\{(x,y)\in R^2, x^2+y^2\le 4\}$.

8. Integralni hisoblang. $\int\limits_{\breve{A}B} (x+y)ds$, bunda AB - $\rho=a\sqrt{\cos 2\varphi}$, $-\pi/4\le\varphi\le\pi/4$ tenglama bilan berilgan egri chiziq.

9. Sirtlar bilan chegaralangan jismlarning hajmini toping. $z=x^2+y^2, y=x^2, y=1, z=0$

10. Integralni hisoblang. $\iiint\limits_V (\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2})dxdydz, (V)\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$

11. Integralni hisoblang. $\int\limits_{\breve{A}B} (x^2+y^2)ds$, bunda AB - $\begin{cases} x=a(\cos t+t\sin t) \\ y=a(\sin t-t\cos t) \end{cases}, 0\le t\le 2\pi$ tenglama bilan berilgan egri chiziq.

12. Integralni hisoblang. $\iint\limits_{(D)} xy^2dxdy$, $(D)=\left\{(x,y)\in R^2, y^2=2px, x=\frac{p}{2}, (p>0)\right\}$

13. Integralni hisoblang. $\iint\limits_{(D)} (x+y)dxdy$, $(D)=\{(x,y)\in R^2, x^2+y^2\le x+y\}$.

14. Integralni hisoblang. $\int\limits_C e^{\sqrt{x^2+y^2}}ds,$, bunda C - $r=a, \varphi=0, \varphi=\frac{\pi}{4}$ tenglama bilan berilgan qutb koordinatalar sistemasida berilgan.

15. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy+x+y)dx+(xy+x-y)dy, K:\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

16. Integralni hisoblang. $\iint\limits_{(D)} (|x|+|y|)dxdy$, $(D)=\{(x,y)\in R^2, |x|+|y|\le 1\}$.

17. Integralni hisoblang. $\int\limits_{\breve{A}B} xyds$, bunda AB - $|x|+|y|=1$ tenglama bilan berilgan chiziq.

18. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy+x+y)dx+(xy+x-y)dy, K:\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

19. Integralni hisoblang. $\iint\limits_{(D)} \sin\sqrt{x^2+y^2}dxdy$, $(D)=\{(x,y)\in R^2, \pi^2\le x^2+y^2\le 4\pi^2\}$

20. Integralni hisoblang. $\int\limits_{\breve{A}B} yds$, bunda AB - $y^2=2x$ parabolaning $A(0;0), B(1;\sqrt{2})$ nuqtalari orasidagi bo'lagi.

21. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy+x+y)dx+(xy+x-y)dy, K:\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

22. Integralni hisoblang. $\iint\limits_{(D)} |xy|dxdy$, $(D)=\{(x,y)\in R^2, x^2+y^2\le 4\}$

23. Integralni hisoblang. $\int\limits_{\breve{A}B} \frac{1}{x+y} ds$, bunda AB - $y = x + 2$ to'g'ri chiziqning $A(2;4), B(1;3)$ nuqtalari orasidagi bo'lagi.

24. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy + x + y)dx + (xy + x - y)dy, K : \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

25. Integralni hisoblang. $\int\limits_{\breve{A}B} \frac{1}{x+y} ds$, bunda AB - $y = x + 2$ to'g'ri chiziqning $A(2;4), B(1;3)$ nuqtalari orasidagi bo'lagi.

26. Integralni hisoblang. $\iint\limits_{(D)} xy^2 dxdy$, $(D) = \left\{(x, y) \in R^2, y^2 = 2px, x = \frac{p}{2}, (p > 0)\right\}$

27. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy + x + y)dx + (xy + x - y)dy, K : \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

28. Integralni hisoblang. $\iint\limits_{(D)} y^2\sqrt{1-x^2}\, dxdy$, $(D) = \left\{(x, y) \in R^2, x^2 + y^2 \le 1\right\}$.

29. Integralni hisoblang. $\int\limits_{\breve{A}B} (x + y)ds$, bunda AB -tekislikning $A(0;2), B(2;0)$ nuqtalarini tutashtiruvchi to'g'ri chiziq.

30. Grin formulasidan foydalanib integralni hisoblang.
$\oint\limits_K e^x((1-\cos y)dx - (y - \sin y)dy), K : 0 \le x \le \pi, 0 \le y \le \sin x$

31. Integralni hisoblang. $\iint\limits_{(D)} y^2\sqrt{1-x^2}\, dxdy$, $(D) = \left\{(x, y) \in R^2, x^2 + y^2 \le 1\right\}$.

32. Integralni hisoblang. $\int\limits_{\breve{A}B} e^{x^2+y^2} ds$, bunda AB - $\rho = a,\ 0 \le \varphi \le \pi/4$ tenglama bilan berilgan egri chiziq.

33. Sirtlar bilan chegaralangan jismlarning hajmini toping. $z = x^2 + y^2, y = x^2, y = 1, z = 0$

34. Integralni hisoblang. $\iint\limits_{(D)} \frac{x}{\sqrt{1-x^2-y^2}} dxdy$, $(D) = \left\{(x, y) \in R^2, x^2 + y^2 \le x\right\}$.

35. $y = \frac{1}{2}(e^x + e^{-x})(0 \le x \le 1)$ egri chiziqning uzunligini toping

36. Sirtlar bilan chegaralangan jismlarning hajmini toping. $x + y + z = a, x^2 + y^2 = R^2, x = 0, y = 0, z = 0$

37. Integralni hisoblang. $\iiint\limits_V (\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2})dxdydz, (V)\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$

38. Integralni hisoblang. $\int\limits_{\breve{A}B} |y| ds$, bunda AB - $\rho = a\sqrt{\cos 2\varphi},\ -\pi/4 \le \varphi \le \pi/4$ tenglama bilan berilgan egri chiziq.

39. Integralni hisoblang. $\int\limits_{\breve{A}B} \frac{1}{x+y} ds$, bunda AB - $y = x + 2$ to'g'ri chiziqning $A(2;4), B(1;3)$ nuqtalari orasidagi bo'lagi.

40. Integralni hisoblang. $\iint\limits_{(D)} xydxdy$, bunda (D) - $\sqrt{x}+\sqrt{y}=1$ parabola va koordinata o'qlaridan iborat.

41. Integralni hisoblang. $\int\limits_{\breve{A}B} xyds$, bunda AB - $\begin{cases} x = acht \\ y = asht \end{cases}, (0 \le t \le 1)$ giperbola.

42. Integralni hisoblang. $\int\limits_{\breve{A}B} \frac{1}{x^2+y^2+z^2} ds$, bunda AB - $x = a\cos t, y = a\sin t, z = bt$ tenglama bilan berilgan egri chiziq

43. Sirtlar bilan chegaralangan jismlarning hajmini toping. $x+y+z=a, x^2+y^2=R^2, x=0, y=0, z=0$

44. Integralni hisoblang. $\int\limits_{\breve{A}B} xyds$, bunda AB - $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ ellips.

45. Integralni hisoblang. $\iint\limits_{(D)} \ln(1+x^2+y^2)dxdy$, $(D)=\left\{(x,y)\in R^2, x^2+y^2\le 1\right\}$

46. Integralni hisoblang. $\iint\limits_{(D)} \cos(x^2+y^2)dxdy$, $(D)=\left\{(x,y)\in R^2, x^2+y^2\le a^2\right\}$.

47. Integralni hisoblang. $\int\limits_{\breve{A}B} (x+y)ds$, bunda AB - $r^2=a^2\cos 2\varphi$ tenglama bilan berilgan chiziq.

48. Integralni hisoblang. $\iiint\limits_{V} xy^2z^3 dzdydz, (V) z = xy, y = x, x = 1, z = 0$

49. Integralni hisoblang. $\iint\limits_{(D)} \sqrt{\sqrt{x}+\sqrt{y}}\,dxdy$, bunda (D) - $\sqrt{x}+\sqrt{y}=1$ parabola va koordinata o'qlaridan iborat.

50. Integralni hisoblang. $\int\limits_{\breve{A}B} \frac{x}{y} ds$, bunda AB - $y^2=2x$ parabolaning $A(1;\sqrt{2}), B(2;2)$ nuqtalari orasidagi bo'lagi.

51. Integralni hisoblang. $\iiint\limits_{V} (\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2})dxdydz, (V) \frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$

52. Integralni hisoblang. $\iiint\limits_{V} (\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2})dxdydz, (V) \frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$

53. Integralni hisoblang. $\int\limits_{\breve{A}B} \left(4\sqrt[3]{x}-3\sqrt{y}\right)ds$, bunda AB -tekislikning $A(-1;0), B(0;1)$ nuqtalarini tutashtiruvchi to'g'ri chiziq.

54. Integralni hisoblang. $\iint\limits_{(D)} \ln(1+x^2+y^2)dxdy$, $(D)=\left\{(x,y)\in R^2, x^2+y^2\le 1\right\}$

55. $\int\limits_0^a \int\limits_0^{\sqrt{2ay-y^2}} f(x,y)dxdy$ karrali integralning integrallash tartibini o'zgartiring.

56. Integralni hisoblang. $\iint\limits_{(D)}\left(1-\left(\frac{x}{a}\right)^{3/2}-\left(\frac{y}{b}\right)^{3}\right)dxdy$,

$(D)=\left\{(x,y)\in R^2, x\ge 0, y\ge 0, \left(\frac{x}{a}\right)^{3/2}+\left(\frac{y}{b}\right)^{3}\le 1\right\}$.

57. Integralni hisoblang. $\int\limits_{\breve{A}B}\left(4\sqrt[3]{x}-3\sqrt{y}\right)ds$, bunda AB-tekislikning $A(-1;0), B(0;1)$ nuqtalarini tutashtiruvchi to'g'ri chiziq.

58. Integralni hisoblang. $\iint\limits_{(D)}(x^2+y^2)dxdy$, bunda (D)-tomonlari $y=x, y=x+a, y=a, y=3a\,(a>0)$ parallelogrammdan iborat.

59. $y=1-\ln\cos x\,(0\le x\le \pi/4)$ egri chiziqning uzunligini toping.

60. Integralni hisoblang. $\iiint\limits_{V}(\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2})dxdydz, (V)\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$

61. Integralni hisoblang. $\iint\limits_{(D)}xydxdy$, bunda (D)- $\sqrt{x}+\sqrt{y}=1$ parabola va koordinata o'qlaridan iborat.

62. $y=\frac{1}{2}(e^x+e^{-x})(0\le x\le 1)$ egri chiziqning uzunligini toping

63. Integralni hisoblang. $\iiint\limits_{V}(\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2})dxdydz, (V)\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$

64. Integralni hisoblang. $\iint\limits_{(D)}(x^2+y^2)dxdy$, $(D)=\left\{(x,y)\in R^2, 1\le xy\le 2, 0\le x\le 2y\le 4x\right\}$.

65. $y^2=x^3, 0\le x\le 5$ egri chiziqning uzunligini toping

66. Integralni hisoblang. $\iiint\limits_{V}xy^2z^3dzdydz, (V) z=xy, y=x, x=1, z=0$

67. Integralni hisoblang. $\iint\limits_{(D)}\operatorname{sgn}(x^2-y^2+2)dxdy$, $(D)=\left\{(x,y)\in R^2, x^2+y^2\le 4\right\}$.

68. Integralni hisoblang. $\int\limits_{\breve{A}B}(x^{4/3}+y^{4/3})ds$, bunda AB - $x^{2/3}+y^{2/3}=1$ tenglama bilan berilgan egri chiziq.

69. Integralni hisoblang. $\iiint\limits_{V}(\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2})dxdydz, (V)\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$

70. Integralni hisoblang. $\iint\limits_{(D)}xy^2dxdy$, $(D)=\left\{(x,y)\in R^2, y^2=2px, x=\frac{p}{2}, (p>0)\right\}$.

71. Integralni hisoblang. $\int\limits_{\breve{A}B}\frac{1}{y^2}ds$, bunda AB - $y=ach\frac{x}{a}$ tenglama bilan berilgan egri chiziq.

72. Sirtlar bilan chegaralangan jismlarning hajmini toping. $z=x^2+y^2, y=x^2, y=1, z=0$

73. Integralni hisoblang. $\iint\limits_{(D)} |x+y|\,dxdy$, bunda (D)-uchlari $A(0,0); B(0,2); C(2,0); D(2,2)$ bo'lgan kvadrat.

74. Integralni hisoblang. $\int\limits_{AB} \sqrt{x^2+y^2}\,ds$, bunda AB - $x^2+y^2=x$ tenglama bilan berilgan aylana.

75. Grin formulasidan foydalanib integralni hisoblang. $\oint\limits_K (xy+x+y)dx+(xy+x-y)dy, K: \frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

76. $y=1-\ln\cos x\,(0\le x\le \pi/4)$ egri chiziqning uzunligini toping.

77. Integralni hisoblang. $\int\limits_{AB} \frac{1}{x^2+y^2+z^2}ds$, bunda AB - $x=a\cos t, y=a\sin t, z=bt$ tenglama bilan berilgan egri chiziq.

78. Integralni hisoblang. $\iint\limits_{(D)} \cos(x^2+y^2)dxdy$, $(D)=\left\{(x,y)\in R^2, x^2+y^2\le a^2\right\}$.