Matematik analiz fanidan davlat attestatsiyasi yozma ishi savollari bazasi

1. $\frac{2}{1!},\frac{4}{2!},\frac{8}{3!},...,\frac{2^n}{n!},...$ ketma-ketlikning chegaralanganligini ko‘rsating.

2. $x_n=\frac{n^2}{2^n}$ ketma-ketlikning chegaralanganligini ko‘rsating.

3. $x_n=1+\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+...+\frac{1}{(n-1)\cdot n},\ (n\geq 2)$ ketma-ketlikning chegaralanganligini ko‘rsating.

4. $x_n=\log_{(n+1)} 2$ ketma-ketlikning chegaralanganligini ko‘rsating.

5. $x_n=\frac{n}{3^n}$ ketma-ketlikni monotonlikka tekshiring.

6. $x_n=\frac{3^n}{n!}$ ketma-ketlikni monotonlikka tekshiring.

7. Funksiyaning aniqlanish sohasini toping. $y=\lg(x+2)+\lg(x-2)$

8. Berilgan funksiyaning uzilish turini aniqlang. $f(x)=\frac{1}{1-x^2}$

9. Funksiyaning aniqlanish sohasini toping. $y=\arcsin\frac{2x}{1+x}$

10. Funksiyaning aniqlanish sohasini toping. $y=arc\cos(2\sin x)$

11. Funksiyaning aniqlanish sohasini toping. $y=\lg(\cos(\lg x))$

12. Funksiyaning aniqlanish sohasini toping. $y=ctg\pi x+\arccos(2^x)$

13. Funksiyani monotonlikka tekshiring. $f(x)=x^2e^{-x}$

14. Funksiyaning qavariqlik va botiqlik oraliqlarini toping. $f(x)=\frac{1}{1-x^2}$

15. Funksiyaning egilish nuqtalarini toping. $f(x)=\frac{x^4}{(1+x^3)}$

16. Funksiyaning ekstremum qiymatlarini toping. $f(x)=\frac{\ln^2 x}{x}$

17. Funksiyani monotonlikka tekshiring. $f(x)=x^2\ln x$

18. Funksiyaning egilish nuqtalarini toping. $f(x) = 2x^2 + \ln x$

19. Funksiyaning qavariqlik va botiqlik oraliqlarini toping. $f(x) = x^5 - 10x^2 + 3x$

20. Funksiyaning qavariqlik va botiqlik oraliqlarini toping. $f(x) = \ln x$

21. Funksiyani monotonlikka tekshiring. $f(x) = x^2 - \ln x^2$

22. Funksiyani monotonlikka tekshiring. $f(x) = x^2 2^{-x}$

23. Funksiyaning egilish nuqtalarini toping. $f(x) = 1 + x^2 - \frac{x^4}{2}$

24. Funksiyaning egilish nuqtalarini toping. $f(x) = 4x^2 + \frac{1}{x}$

25. Funksiyani monotonlikka tekshiring. $f(x) = x + \sin 2x$

26. Funksiyaning egilish nuqtalarini toping. $f(x) = (x^2 - 1)^3$

27. Funksiyaning ekstremum qiymatlarini toping. $f(x) = x + \frac{1}{x}$

28. Funksiyaning ekstremum qiymatlarini toping. $f(x) = xe^{-x}$

29. Lopital qoidasidan foydalanib limitni hisoblang. $\lim\limits_{x\to 0} \frac{\arcsin 2x - 2\arcsin x}{x^2}$

30. Lopital qoidasidan foydalanib limitni hisoblang. $\lim\limits_{x\to 1} \frac{x^x - 1}{\ln x}$

31. Qatorga yoyishdan foydalanib quyidagi limitni hisoblang. $\lim\limits_{x\to 0} \frac{\cos x - 1 + \frac{x^2}{2}}{x^4}$

32. Qatorga yoyishdan foydalanib quyidagi limitni hisoblang. $\lim\limits_{x\to 0} \frac{tgx - \sin x}{x^3}$

33. Limitni hisoblang. $\lim\limits_{x\to\infty} \left(\frac{x+a}{x-a}\right)^x$

34. Limitni hisoblang. $\lim\limits_{x\to 0} \frac{(1+x)^5 - (1+5x)}{x^2 + x^5}$

35. Limitni hisoblang. $\lim\limits_{n\to\infty} \frac{1\cdot 2 + 2\cdot 3 + \ldots + n(n+1)}{n^3}$

36. Limitni hisoblang. $\lim\limits_{n\to\infty} \left(\sqrt{n^2 + n + 1} - \sqrt{n^2 - 1}\right)$

37. Limitni hisoblang. $\lim\limits_{x\to 1}\dfrac{x^2-1}{2x^2-x-1}$

38. Limitni hisoblang. $\lim\limits_{n\to\infty} n\left(\sqrt{n^4+n+1}-\sqrt{n^4+1}\right)$

39. Limitni hisoblang. $\lim\limits_{x\to 3}\dfrac{x^2-5x+6}{x^2-8x+15}$

40. Limitni hisoblang. $\lim\limits_{x\to 0}\dfrac{(1+x)(1+2x)(1+3x)-1}{x}$

41. Limitni hisoblang. $\lim\limits_{x\to 1}\dfrac{x^3-3x+2}{x^4-4x+3}$

42. Limitni hisoblang. $\lim\limits_{n\to\infty}\left(\dfrac{1}{1\cdot 2}+\dfrac{1}{2\cdot 3}+\ldots+\dfrac{1}{n\cdot(n+1)}\right)$

43. Limitni hisoblang. $\lim\limits_{n\to\infty}\left(\dfrac{1}{3}+\dfrac{1}{15}+\ldots+\dfrac{1}{4n^2-1}\right)$

44. Limitni hisoblang. $\lim\limits_{x\to 2}\dfrac{x^3-2x^2-4x+8}{x^4-8x^2+16}$

45. Limitni hisoblang. $\lim\limits_{n\to\infty}\left(\dfrac{1}{n^2}+\dfrac{2}{n^2}+\ldots+\dfrac{n-1}{n^2}\right)$

46. Limitni hisoblang. $\lim\limits_{x\to -1}\dfrac{x^3-2x-1}{x^5-2x-1}$

47. Limitni hisoblang. $\lim\limits_{x\to 5}\dfrac{\sqrt{6-x}-1}{3-\sqrt{4+x}}$

48. Limitni hisoblang. $\lim\limits_{x\to 0}\dfrac{\sqrt{1-2x-x^2}-(1+x)}{x}$

49. Limitni hisoblang. $\lim\limits_{x\to 8}\dfrac{\sqrt{9+2x}-5}{\sqrt[3]{x}-2}$

50. Limitni hisoblang. $\lim\limits_{x\to -2}\dfrac{\sqrt[3]{x-6}+2}{x^3+8}$

51. Limitni hisoblang. $\lim\limits_{x\to 3}\dfrac{\sqrt{x+13}-2\sqrt{x+1}}{x^2-9}$

52. Funksiyaning ikkinchi tartibli hosilasini toping. $y = x(\cos\ln x + \sin\ln x)$

53. Funksiyaning ikkinchi tartibli hosilasini toping. $y = (x - \sin x)^2$

54. Funksiyaning ikkinchi tartibli hosilasini toping. $y = x^{n-1} \ln x$

55. Funksiyaning ikkinchi tartibli hosilasini toping. $y = x^{n-1} e^{\frac{1}{x}}$

56. Funksiyaning ikkinchi tartibli hosilasini toping. $y = x \cos^2 x$

57. Funksiyaning ikkinchi tartibli hosilasini toping. $y = x \ln \frac{3+x}{3-x}$

58. Funksiyaning ikkinchi tartibli hosilasini toping. $y = \frac{1+x^2}{1-x^2}$

59. Funksiyaning ikkinchi tartibli hosilasini toping. $y = arctg\frac{x}{4}$

60. Funksiyaning ikkinchi tartibli hosilasini toping. $y = e^{tgx}$

61. Aniqmas integralni toping. $\int \frac{x}{x^2 - 3x + 2} dx$

62. Integralni hisoblang. $\int \frac{dx}{\sin^2 x + 2\cos^2 x}$

63. Aniqmas integralni toping. $\int \frac{x}{\sqrt{1-x^2}} dx$

64. Aniqmas integralni toping. $\int \cos x \cdot \cos 4x dx$

65. Aniqmas integralni toping. $\int \frac{dx}{e^{\frac{x}{2}} + e^x}$

66. Aniq integralni hisoblang. $\int_0^2 |1 - x| dx$

67. Aniqmas integralni toping. $\int x\sqrt{1-x^2} dx$

68. Aniqmas integralni toping. $\int \frac{arctgx}{1+x^2} dx$

69. Aniqmas integralni toping. $\int x^n \ln x dx, (n \neq -1)$

70. Aniq integralni hisoblang. $\int_0^2 e^{x^2} \cdot x dx$

71. Aniq integralni hisoblang. $\int_{-\pi}^{\pi} \cos^2 x dx$

72. Aniq integralni hisoblang. $\int_0^1 \frac{x^2}{1+x^6} dx$

73. Aniqmas integralni toping. $\int \frac{xdx}{(x+1)(x^2+1)}$

74. Aniqmas integralni toping. $\int \frac{dx}{(1+x)\sqrt{x}} dx$

75. Aniq integralni hisoblang. $\int_{-2}^{-1} \frac{x+1}{x^2(x-1)} dx$

76. Aniqmas integralni toping. $\int x \sin x dx$

77. Aniqmas integralni toping. $\int arctgx dx$

78. $\lim_{x\to 0} \lim_{y\to\infty} \frac{1}{xy} tg \frac{xy}{1+xy}$

79. $\lim_{y\to 0} \lim_{x\to 0} \frac{x^2 \sin \frac{1}{x} + y}{x+y}$

80. $\lim_{\substack{x\to 0 \\ y\to 0}} \frac{x^2+xy+y^2}{x^2-xy+y^2}$ karrali limitni hisoblang.

81. Funksiyani ekstremumga tekshiring. $f(x;y) = x^3 + y^3 - 3xy$.

82. $f(x,y) = x^4 + y^4 - x^2 - 2xy - y^2$ funksiyani ekstremumga tekshiring

83. $f(x,y) = x^2 + 3y^2 - x + 18y - 4$ funksiyani ekstremumga tekshiring

84. Xususiy hosilalarni toping. $(2x)^{3y}$

85. Xususiy hosilalarni toping. $\ln \sin \frac{x+1}{\sqrt{y}}$

86. Xususiy hosilalarni toping. $arctg \frac{y}{x}$

87. Xususiy hosilalarni toping. $\sqrt{xy + \frac{x}{y}}$

88. Xususiy hosilalarni toping. $\frac{x}{y}e^{xy}$

89. Xususiy hosilalarni toping. $\left(\frac{y}{x}\right)^x$

90. Xususiy hosilalarni toping. $xy \cdot ln(xy)$

91. Xususiy hosilalarni toping. $e^{-\frac{y}{x}}$

92. $x^{(n)} = \left(\frac{1+2+...+n}{\sqrt{9n^4+1)}}; \left(\frac{2n+3}{2n+1}\right)^{n+1}\right)$. $\lim\limits_{n\to\infty} x^{(n)} - ?$

93. $x^{(n)} = \left(\frac{1+4+7+...+(3n-2)}{\sqrt{5n^4+n+1)}}; \left(\frac{n+1}{n-1}\right)^{n}\right)$. $\lim\limits_{n\to\infty} x^{(n)} - ?$

94. 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.

95. Integralni hisoblang. $\int\limits_{\breve{A}B} 4\sqrt[3]{x} - 3\sqrt{y}ds$, bunda AB- A(-1;0), B(0;1) nuqtalarni birlashtiruvchi to‘g‘ri chiziq kesmasi.

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

97. Integralni hisoblang. $\iint\limits_{x^2+y^2\le 1} (x^2+y^2)dxdy$

98. $\iint\limits_{(D)} xy^2 dxdy$, (D)- soha $y^2 = 2px$ parabola va $x = \frac{p}{2}(p > 0)$ chiziqlar bilan chegaralangan.

99. Funksional qatorning yaqinlashish sohasini toping. $\sum\limits_{n=1}^{\infty}(5-x^2)^n$

100. Funksional qatorning absolyut yaqinlashish sohasini toping. $\sum\limits_{n=1}^{\infty}\left[\frac{n}{3}\ln(1+\frac{x}{n})\right]^n$

101. Qatorni yaqinlachuvshanlikga tekshiring. $\sum\limits_{n=1}^{\infty}\frac{n!a^n}{n^n}$, $a \neq e$, $a > 0$

102. Darajali qatorning yaqinlashish radiusi va yaqinlashish intervalini toping. $\sum_{n=1}^{\infty} \frac{x^n}{2^{\sqrt{n}}}$

103. Qatorni yaqinlachuvshanlikga tekshiring. $\sum_{n=1}^{\infty} \frac{(2n+1)!!}{3^n \cdot n!}$

104. Funksional qatorning absolyut yaqinlashish sohasini toping. $\sum_{n=1}^{\infty} n^2 \left(\frac{2x-3}{4} \right)^n$

105. Funksional qatorning yig‘indisini toping. $\sum_{n=1}^{\infty} \frac{x}{[(n-1)x+1](nx+1)}, (0 < x < +\infty)$

106. Qatorni yaqinlachuvshanlikga tekshiring. $\sum_{n=1}^{\infty} 3^{-n} \left(\frac{n+1}{n} \right)^{n^2}$

107. Funksional ketma-ketlikning limit funksiyasini toping.

$f_n(x) = nx^2 \sin \frac{x}{n}, \ -\infty < x < +\infty$

108. Funksional qatorning absolyut yaqinlashish sohasini toping. $\sum_{n=1}^{\infty} \left(\frac{x^2}{n} + x \right)^n$

109. Funksional qatorning absolyut yaqinlashish sohasini toping. $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n^{\ln x}}$

110. Funksional qatorning absolyut yaqinlashish sohasini toping. $\sum_{n=1}^{\infty} n^{-\ln x^2}$

111. Darajali qatorning yaqinlashish radiusi va yaqinlashish intervalini toping. $\sum_{n=0}^{\infty} \frac{x^n}{(n+1)5^n}$

112. Darajali qatorning yaqinlashish radiusi va yaqinlashish intervalini toping. $\sum_{n=1}^{\infty} \frac{x^n}{n}$

113. Darajali qatorning yaqinlashish radiusi va yaqinlashish intervalini toping. $\sum_{n=1}^{\infty} n! x^n$.

114. Darajali qatorning yaqinlashish radiusi va yaqinlashish intervalini toping. $\sum_{n=1}^{\infty} \frac{(-1)^n x^n}{2n+1}$

115. Darajali qatorning yaqinlashish radiusi va yaqinlashish intervalini toping.

$$\sum_{n=1}^{\infty}\left(\frac{2n+4}{5n+7}\right)^n x^n$$

116. Funksional ketma-ketlikning limit funksiyasini toping. $f_n(x) = n[\ln(x+n) - \ln n]$

117. Funksional ketma-ketlikning limit funksiyasini toping.

$$f_n(x) = \left(\frac{n+x}{n-x}\right)^n,\ -\infty < x < +\infty$$

118. $y'' - 16y = 0$ tenglamaning umumiy yechimini toping.

119. $x(y^2+1)dx + y(x^2+1)dy = 0$ tenglamasining umumiy integralini toping.

120. Sohaning chizmasini chizing. $1 < |z-1| < 3$

121. Sohatning chizmasini chizing. $\operatorname{Im}\dfrac{z}{1+i} > 0$

122. Sohaning chizmasini chizing. $|z+i| = |z-i|$

123. Sohaning chizmasini chizing. $|z+1| + |z-1| = 4$

124. Sohaning chizmasini chizing. $\operatorname{Re}\dfrac{1}{z} < 1$

125. Sohaning chizmasini chizing. $|z| > 1 - \operatorname{Re} z$