

Sorawlar dizimi

Qánigelik:	<u>Matematika</u>
Oqıw tili:	<u>qaraqalpaq</u>
Kurs:	<u>3</u>
Semestr:	<u>5</u>
Pán:	Analizdiń standart emes máseleleri
Oqıw jılı:	<u>2024-2025</u>

1. Ten' o'lsheмли u'zliksizlik ha'm u'zliksizliktin' moduli
2. Funktsiyanın' bas bo'legin ayırıp alıw ha'm onı limitlerdi esaplawg'a qollanıwları
3. Vallis formulası ha'm mısallar, onın' qollanıwlarımenen baylanısı
4. Funktsiyalardıń grafiklerin jasaw
5. Shekli ha'm sheksiz qosındılar ushın Gelder ten'sizligi
6. Shekli ha'm sheksiz qosındılar ushın Minkovskiy ten'sizligi
7. Yunga ten'sizligi
8. Rimannın' dzeta funktsiyası ha'm a'piwayı sanlar
9. Stirling formulası ha'm mısallar, onın' qollanıwı menen baylanısı
10. Asimptotikalıq da'rejeli qatarlar, qa'siyetleri
11. Sha'rtli ekstremum ushın Lagranj metodı
12. Lagranj metodının' geometriyalıq interpretatsiyası
13. Yarım u'zliksiz funktsiyalar ha'm olardıń qa'siyetleri
14. Do'nes funktsiyanın' anıqlaması ha'm maksimum printsipi
15. Do'n'es funktsiyalardıń tiykarg'ı qa'siyetleri ha'm kriteriyaları
16. Do'n'es funktsiyalar ushın Iensen ten'sizligi
17. Haqıyqıy funktsiyalardıń menshiksiz integralların qaldıqlar ja'rdeminde esaplaw
18. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \dots + n(n+1) = \frac{n(n+1)(n+2)}{3}$$

1. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$\frac{1}{1 \cdot 5} + \frac{1}{5 \cdot 9} + \frac{1}{9 \cdot 13} + \dots + \frac{1}{(4n-3)(4n+1)} = \frac{n}{4n+1}$$

2. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$1^2 + 3^2 + 5^2 + \dots + (2n-1) \cdot 2 = \frac{n(2n-1)(2n+1)}{3}$$

3. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$1 - 2^2 + 3^2 - 4^2 + \dots + (-1)^n \cdot n^2 = (-1)^{n-1} \cdot \frac{n(n+1)}{2}$$

4. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \dots - \frac{1}{2n} = \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n}$$

5. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$\frac{1^2}{1 \cdot 3} + \frac{2^2}{3 \cdot 5} + \dots + \frac{n^2}{(2n-1)(2n+1)} = \frac{n(n+1)}{2(2n+1)}$$

6. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$\left(1 - \frac{1}{4}\right) \left(1 - \frac{1}{9}\right) \dots \left(1 - \frac{1}{(n+1)^2}\right) = \frac{n+2}{2n+2}$$

7. Matematikalıq induktsiya usılınan paydalanıp, tómendegi teńliktiń qálegen natural san ushın orınlı bolıwın dálilleń:

$$1 \cdot 2 \cdot 3 + 2 \cdot 3 \cdot 4 + 3 \cdot 4 \cdot 5 + \dots + n(n+1)(n+2) = \frac{n}{4}(n+1)(n+2)(n+3)$$

8. Aniqlama járdeminde esaplań $\int_0^{\frac{\pi}{2}} \sin x dx$;

9. Aniqlama járdeminde esaplań $\int_0^x \cos t dt$;

10. Aniqlama járdeminde esaplań $\int_1^2 \frac{dx}{x^2}$;

11. Integraldi esaplań

$$\int_0^{10\pi} \sqrt{1 - \cos 2x} dx$$

12. Integraldi esaplañ

$$\int_0^a x^2 \sqrt{a^2 - x^2} dx$$

13. Integraldi esaplañ $\int_{-1}^2 x^3 dx$

14. Integraldi esaplañ $\int_1^4 \frac{dx}{\sqrt[3]{x}}$

15. Integraldi esaplañ $\int_1^2 (x^2 - 2x + 3) dx$

16. Integraldi esaplañ $\int_{-1}^1 (x^3 - 2x^2 + x - 1) dx$

17. Integraldi esaplañ $\int_0^1 (\sqrt{x} + \sqrt[3]{x^2}) dx$

18. Integraldi esaplañ $\int_0^{\pi} \sin x dx$

19. Integraldi esaplañ $\int_{1/\sqrt{3}}^{\sqrt{3}} \frac{dx}{1 + x^2}$

20. Integraldi esaplañ $\int_{-1/2}^{1/2} \frac{dx}{\sqrt{1 - x^2}}$

21. Integraldi esaplañ $\int_{-\pi/4}^0 \frac{dx}{\cos^2 x}$

22. Integraldi esaplañ $\int_2^9 \sqrt[3]{x - 1} dx$

23. Integraldi esaplañ $\int_1^2 e^x dx$

24. Integraldi esaplañ $\int_0^2 2^x dx$

25. Integraldi esaplañ $\int_2^4 \frac{dx}{x}$

26. Integraldi esaplañ $\int_1^2 \frac{dx}{2x - 1}$

27. Integraldi esaplañ $\int_0^1 \frac{x^2 dx}{1+x^6}$
28. Integraldi esaplañ $\int_e^{e^2} \frac{dx}{x \ln x}$
29. Integraldi esaplañ $\int_{e^2}^{e^3} \frac{dx}{x \ln x}$
30. Integraldi esaplañ $\int_{-\pi}^{\pi} \sin^2 x dx$
31. Integraldi esaplañ $\int_{-\pi}^{\pi} \cos^2 x dx$
32. Integraldi esaplañ $\int_{\pi/6}^{\pi/3} \operatorname{tg}^4 x dx$
33. Integraldi esaplañ $\int_0^2 \operatorname{sh}^3 x dx$
34. Integraldi esaplañ $\int_0^1 \frac{dx}{4x^2 + 4x + 5}$
35. Integraldi esaplañ $\int_3^4 \frac{x^2 + 3}{x - 2} dx$
36. Integraldi esaplañ $\int_{-2}^{-1} \frac{x + 1}{x^2(x - 1)} dx$
37. Integraldi esaplañ $\int_2^3 \frac{dx}{x^2 - 2x - 8}$
38. Integraldi esaplañ $\int_0^2 \frac{2x - 1}{2x + 1} dx$
39. Integraldi esaplañ $\int_0^1 \frac{x^2 + 3x}{(x + 1)(x^2 + 1)} dx$
40. Integraldi esaplañ $\int_0^1 \frac{dx}{\sqrt{x^2 + 2x + 2}}$
41. Integraldi esaplañ $\int_{3/4}^2 \frac{dx}{\sqrt{2 + 3x - 2x^2}}$
42. Integraldi esaplañ $\int_0^4 \frac{dx}{1 + \sqrt{x}}$
43. Integraldi esaplañ $\int_0^{\pi/4} \frac{dx}{1 + 2\sin^2 x}$

44. Integraldi esaplań $\int_0^1 x e^{-x} dx$
45. Integraldi esaplań $\int_{\pi/4}^{\pi/3} \frac{x dx}{\sin^2 x}$
46. Integraldi esaplań $\int_1^3 \ln x dx$
47. Integraldi esaplań $\int_1^2 x \ln x dx$
48. Integraldi esaplań $\int_0^{1/2} \arcsin x dx$
49. Integraldi esaplań $\int_0^2 |1 - x| dx$
50. Teńsizlikti dálilleń $\frac{1}{10\sqrt{2}} < \int_0^1 \frac{x^9}{\sqrt{1+x}} dx < \frac{1}{10}$
51. Teńsizlikti dálilleń $\frac{1}{20\sqrt[3]{2}} < \int_0^1 \frac{x^{19}}{\sqrt[3]{1+x^6}} dx < \frac{1}{20}$
52. Teńsizlikti dálilleń $0 < \int_0^{200} \frac{e^{-5x}}{x+20} dx < 0,01$
53. Teńsizlikti dálilleń $1 < \int_0^1 \frac{1+x^{20}}{1+x^{40}} dx < 1 + \frac{1}{42}$
54. Teńsizlikti dálilleń $1 - \frac{1}{n} < \int_0^1 e^{-x^n} dx < 1, \quad n > 1$
55. Teńsizlikti dálilleń $0 < \int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{\sin x}{x} dx < \ln 3$
56. Teńsizlikti dálilleń $\sin 1 < \int_{-1}^1 \frac{\cos x}{1+x^2} dx < 2 \sin 1$
57. Teńsizlikti dálilleń $\frac{2}{\pi} \ln \frac{\pi+2}{2} < \int_0^{\frac{\pi}{2}} \frac{\sin x}{x(x+1)} dx < \ln \frac{\pi+2}{3}$
58. Teńsizlikti dálilleń $\frac{1}{8} < \frac{\pi}{6} \int_0^2 \frac{\sin \frac{\pi}{6}(x+1)}{(x+1)(3-x)} dx < \frac{1}{6}$
59. Teńsizlikti dálilleń $0,03 < \int_0^1 \frac{x^7}{(e^x + e^{-x})\sqrt{1+x^2}} dx < 0,05$

60. Integraldi esaplań $\int_0^2 f(x)dx$, $f(x) = \begin{cases} x^2, \text{ arap } 0 \leq x \leq 1, \\ 2 - x, \text{ arap } 1 < x \leq 2. \end{cases}$

61. Integraldi esaplań $\int_0^1 f(x)dx$, $f(x) = \begin{cases} x, \text{ arap } 0 \leq x \leq t, \\ t \frac{1-x}{1-t}, \text{ arap } t < x \leq 1. \end{cases}$

62. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{1}{n^2} + \frac{2}{n^2} + \dots + \frac{n-1}{n^2} \right)$$

63. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{n+n} \right)$$

64. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{n}{n^2 + 1^2} + \frac{n}{n^2 + 2^2} + \dots + \frac{n}{n^2 + n^2} \right)$$

65. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \left(\sin \frac{\pi}{n} + \sin \frac{2\pi}{n} + \dots + \sin \frac{(n-1)\pi}{n} \right)$$

66. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1^p + 2^p + \dots + n^p}{n^{p+1}} \quad (p > 0)$$

67. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \left(\sqrt{1 + \frac{1}{n}} + \sqrt{1 + \frac{2}{n}} + \dots + \sqrt{1 + \frac{n}{n}} \right)$$

68. Limitti esaplań $\lim_{x \rightarrow 0} \frac{\int_0^x \cos t^2 dt}{x}$

69. Limitti esaplań $\lim_{x \rightarrow +\infty} \frac{\int_0^x (\arctgt)^2 dt}{\sqrt{x^2 + 1}}$

70. Limitti esaplań $\lim_{x \rightarrow +\infty} \frac{\left(\int_0^x e^{t^2} dt \right)^2}{\int_0^x e^{2t^2} dt}$

71. Limitti esaplań $\lim_{x \rightarrow +0} \frac{\int_0^{\sin x} \sqrt{\operatorname{tg} t} dt}{\int_0^{\operatorname{tg} x} \sqrt{\sin t} dt}$

72. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-\pi}^{\pi} \sqrt[3]{\sin x} dx$

73. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-\pi}^{\pi} e^{x^2} \sin x dx$

74. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-\pi/2}^{\pi/2} (\cos^2 x + x^2 \sin x) dx$

75. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-1}^1 \cos x \operatorname{th} x dx$

76. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-1}^1 (e^x + e^{-x}) \operatorname{tg} x dx$

77. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-\pi/3}^{\pi/3} \left(x^2 \sin 5x + \cos \frac{x}{3} + \operatorname{tg}^3 x \right) dx$

78. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_{-\pi/3}^{\pi/3} \frac{2x^7 - x^5 + 2x^3 - x + 1}{\cos^2 x} dx$

79. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^2 e^{x^2} x dx$

80. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^1 x^2 \sqrt{1-x^2} dx$

81. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^{\ln 2} \sqrt{e^x - 1} dx$

82. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^{\ln 2} x e^{-x} dx$

83. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^{\pi} x \sin x dx$

84. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^{\pi/4} x \sin 2x dx$

85. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^{2\pi} x^2 \cos x dx$

86. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^1 \arccos x dx$

87. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_1^3 \arctg \sqrt{x} dx$

88. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_1^e \frac{dx}{x \sqrt{1 + \ln x}}$

89. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

esaplań $\int_0^1 \frac{e^{2x} + 2e^x}{e^{2x} + 1} dx$

90. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_0^{\pi/2} \frac{dx}{2 - \sin x}$$

91. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_{\pi/3}^{\pi/2} \frac{dx}{3 + \cos x}$$

92. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_0^{3/4} \frac{dx}{(x+1)\sqrt{x^2+1}}$$

93. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_1^9 x \cdot \sqrt[3]{1-x} dx$$

94. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_{-3}^{-2} \frac{dx}{x\sqrt{x^2-1}}$$

95. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_0^1 x^{15} \sqrt{1+3x^8} dx$$

96. Ózgeriwshilerdi almastiriw yaki bóleklep integrallaw usili járdeminde

$$\text{esaplań } \int_0^{\pi/2} \sin x \sin 2x \sin 3x dx$$

97. Qaysisi úlken ekenligin aniqlań

$$\int_0^{\pi/2} \frac{\sin x}{x} dx \quad \text{ёки} \quad \int_0^{\pi} \frac{\sin x}{x} dx$$

98. Qaysisi úlken ekenligin aniqlań

$$\int_{1/2}^1 \frac{dx}{\sqrt{x}} \quad \text{ёки} \quad \int_{1/2}^1 \frac{dx}{\sqrt[3]{x}}$$

99. Qaysisi úlken ekenligin aniqlań $\int_0^1 e^{-x} \sin x dx$ ёки $\int_0^1 e^{-x^2} \sin x dx$

100. Qaysisi úlken ekenligin anıqlań $\int_1^2 \frac{dx}{\sqrt{1+x^2}}$ ėкн $\int_1^2 \frac{dx}{x}$

101. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n} \right)$$

102. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} n \cdot \left(\frac{1}{n^2+1^2} + \frac{1}{n^2+2^2} + \dots + \frac{1}{2n^2} \right)$$

103. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{1}{n^2} + \frac{2}{n^2} + \dots + \frac{n-1}{n^2} \right)$$

104. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1 + \sqrt[3]{2} + \sqrt[3]{3} + \dots + \sqrt[3]{n}}{\sqrt[3]{n^4}}$$

105. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{1^3}{n^4} + \frac{2^3}{n^4} + \frac{3^3}{n^4} + \dots + \frac{(4n-1)^3}{n^4} \right)$$

106. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{3}{n} \left(1 + \sqrt{\frac{n}{n+3}} + \sqrt{\frac{n}{n+6}} + \dots + \sqrt{\frac{n}{n+3(n-1)}} \right)$$

107. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} n \left(\frac{1}{(n+1)^2} + \frac{1}{(n+2)^2} + \dots + \frac{1}{(2n)^2} \right)$$

108. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} n^2 \left(\frac{1}{(n^2+1)^2} + \frac{1}{(n^2+2)^2} + \dots + \frac{1}{(n^2+n)^2} \right)$$

109. Anıq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{1}{\sqrt{4n^2 - 1^2}} + \frac{1}{\sqrt{4n^2 - 2^2}} + \dots + \frac{1}{\sqrt{4n^2 - n^2}} \right)$$

110. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \cdot \left(\sqrt{1 + \frac{1}{n}} + \sqrt{1 + \frac{2}{n}} + \dots + \sqrt{1 + \frac{n}{n}} \right)$$

111. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \left(1 + \frac{1}{\cos^2 \frac{\pi}{4n}} + \frac{1}{\cos^2 \frac{2\pi}{4n}} + \frac{1}{\cos^2 \frac{3\pi}{4n}} + \dots + \frac{1}{\cos^2 \frac{n\pi}{4n}} \right)$$

112. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \cdot \left(\sin \frac{\pi}{n} + \sin \frac{2\pi}{n} + \dots + \sin \frac{(n-1)\pi}{n} \right)$$

113. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left[\frac{1}{n} \cdot \sum_{k=1}^n f \left(a + k \cdot \frac{b-a}{n} \right) \right], f(x) \text{ функция } [a, b] \text{ да интегралланувчи}$$

114. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left[\left(1 + \frac{1}{n} \right) \cdot \frac{\pi}{n^2} + \left(1 + \frac{2}{n} \right) \cdot \frac{2\pi}{n^2} + \dots + \left(1 + \frac{n}{n} \right) \cdot \frac{n\pi}{n^2} \right]$$

115. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{\pi}{n} \cdot \left(\frac{1}{2 + \cos \frac{\pi}{n}} + \frac{1}{2 + \cos \frac{2\pi}{n}} + \dots + \frac{1}{2 + \cos \frac{n\pi}{n}} \right)$$

116. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \left[\left(x + \frac{1}{n} \right) + \left(x + \frac{2}{n} \right) + \dots + \left(x + \frac{n}{n} \right) \right]$$

117. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1}{n} \left(2^{\frac{1}{n}} + 2^{\frac{2}{n}} + \dots + 2^{\frac{n}{n}} \right)$$

118. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \left(\frac{2^{\frac{1}{n}}}{n+1} + \frac{2^{\frac{2}{n}}}{n+\frac{1}{2}} + \dots + \frac{2^{\frac{n}{n}}}{n+\frac{1}{n}} \right)$$

119. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \sin \frac{\pi}{n} \sum_{k=1}^n \frac{1}{2 + \cos \frac{k\pi}{n}}$$

120. Aniq integral járdeminde limitti esaplań

$$\lim_{n \rightarrow \infty} \frac{1^p + 2^p + \dots + n^p}{n^{p+1}} \quad (p > 0)$$

121. Integraldi esaplań $\int_0^{\pi/4} \frac{dx}{1 + 2 \sin^2 x}$

122. Integraldi esaplań $\int_0^1 x e^{-x} dx$

123. Integraldi esaplań $\int_{\pi/4}^{\pi/3} \frac{x dx}{\sin^2 x}$

124. Integraldi esaplań $\int_1^3 \ln x dx$

125. Integraldi esaplań $\int_1^2 x \ln x dx$

126. Integraldi esaplań $\int_0^{1/2} \arcsin x dx$

127. Integraldi esaplań $\int_0^{\pi} x^3 \sin x dx$

128. Integraldi esaplań $\int_0^{\pi/2} e^{2x} \cos x dx$

129. Integraldi esaplań $\int_0^e \sin \ln x dx$

130. Integraldi esaplañ $\int_0^2 |1-x| dx$

131. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

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

132. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

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

133. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

$$\sum_{n=2}^{\infty} \frac{1}{(\ln n)^n}$$

134. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

$$\sum_{n=1}^{\infty} \left(\frac{an}{n+2}\right)^n, \quad a > 0$$

135. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

$$\sum_{n=1}^{\infty} 3^{n+1} \left(\frac{n+2}{n+3}\right)^{n^2}$$

136. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

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

137. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

$$\sum_{n=1}^{\infty} \frac{(2n)!}{(n!)^2}$$

138. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

$$\sum_{n=1}^{\infty} \frac{n! a^n}{n^n}, \quad a \neq e, \quad a > 0$$

139. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqililiqqa tekserin

$$\sum_{n=1}^{\infty} n^{n^a} - 1$$

140. Koshi yaki Dalamber belgilerinen paydalanip qatardi jiynaqliliqqa tekserin

$$\sum_{n=1}^{\infty} 3^{-n} \left(\frac{n+1}{n} \right)^{n^2}$$

141. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = 3x - x^3$

142. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = 8x^3 - x^4$

143. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin

$$f(x) = x^3 - 3x + 5$$

144. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin

$$f(x) = x(1 + 2\sqrt{x})$$

145. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = e^{kx}$

146. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = x |x|$

147. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = \frac{2x}{1+x^2}$

148. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = |x|^3$

149. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = \frac{e^x}{x}$

150. Berilgen funkciyaniń ósiwshi, kemeyiwshi araliqlarin tabin $f(x) = \cos x - x$

151. Tómendegi teńsizlikti dálillen

$$x + \frac{1}{x} \geq 2 \quad (x > 0)$$

152. Tómendegi teńsizlikti dálillen

$$2\sqrt{x} > 3 - \frac{1}{x} \quad (x > 1)$$

153. Tómendegi teńsizlikti dálillen $(1+x)^\alpha \geq 1 + \alpha x \quad (x \geq -1, \alpha > 1)$

154. Tómendegi teńsizlikti dálillen $e^x \geq 1 + x$

155. Tómendegi teńsizlikti dálillen $\ln(1+x) > \frac{x}{x+1} \quad (x > 0)$

156. Tóمندegi teńsizlikti dálilleń $1 - 2\ln x \leq \frac{1}{x^2} \quad (x > 0)$

157. Tóمندegi teńsizlikti dálilleń $(a + b)^\alpha \leq a^\alpha + b^\alpha \quad (0 \leq \alpha \leq 1)$

158. Tóمندegi teńsizlikti dálilleń $\sqrt[n]{x} - \sqrt[n]{y} \leq \sqrt[n]{x - y} \quad (x \geq y \geq 0.)$

159. Tóمندegi teńsizlikti dálilleń $\left(\frac{x + y}{2}\right)^n \leq \frac{x^n + y^n}{2}$

$(x \geq 0, y \geq 0, n \in \mathbb{N})$

160. Tóمندegi teńsizlikti dálilleń $\frac{x - y}{x} < \ln \frac{x}{y} < \frac{x - y}{y} \quad (x > y > 0)$

161. Funkciyaniń mánisler oblastin tabıń $y = \frac{2}{\sqrt{25 - x^2}}$

162. Funkciyaniń mánisler oblastin tabıń $y = \sqrt{2x + 1} - \sqrt{x + 1}$

163. Funkciyaniń mánisler oblastin tabıń $y = \frac{1}{\sqrt{|x| + x}}$

164. Funkciyaniń mánisler oblastin tabıń $y = \lg(1 - x^2)$

165. Funkciyaniń mánisler oblastin tabıń $y = \sqrt{9 - x^2} + \log \frac{x + 1}{x - 2}$

166. Funkciyaniń mánisler oblastin tabıń $y = \frac{\sqrt{x}}{\sin \pi x}$

167. Funkciyaniń mánisler oblastin tabıń $y = \sqrt{\sin \sqrt{x}}$

168. Funkciyaniń mánisler oblastin tabıń $y = \arccos \frac{2x}{1 + x^2}$

169. Funkciyaniń mánisler oblastin tabıń $y = \sqrt{\arcsin(\log_2 x)}$

170. Funkciyaniń mánisler oblastin tabıń $y = \sqrt{\arcsin\left(\lg \frac{x}{10}\right)}$

171. Funkciyaniń mánisler oblastin tabıń $y = \frac{x}{1 + x^2}$

172. Funkciyaniń mánisler oblastin tabıń $y = \frac{x^2 - 5}{2x - 5}$

173. Funkciyaniń mánisler oblastin tabıń $y = x + \operatorname{sign} x$

174. Funkciyaniń mánisler oblastin tabıń $y = x + \frac{1}{x} \quad \{x > 0\}$

175. Funkciyaniń mánisler oblastin tabıń $y = \sqrt{\frac{9x^2 + 1}{x}}$

176. Funkciyaniń mánisler oblastin tabıń $y = \lg(1 - 2 \cos x)$

177. Funkciyaniń mánisler oblastin tabıń $y = \frac{x^2 + x + 2}{x^2 - x + 2}$

178. Funkciyaniń mánisler oblastin tabıń $y = \sin x + \cos x$

179. Funkciyaniń mánisler oblastin tabıń $y = ||x| - 1| - x$

180. Funkciyaniń mánisler oblastin tabıń $y = x^2 - 4 \cdot |x - 1| + 1$

181. Funksiyaniń grafigin siziń $f(x) = x^3$

182. Funksiyaniń grafigin siziń $f(x) = (x - 1)^3$

183. Funksiyaniń grafigin siziń $f(x) = (x + 1)^3$

184. Funksiyaniń grafigin siziń $f(x) = |x^3|$

185. Funksiyaniń grafigin siziń $f(x) = -x^2 \cdot |x|$

186. Funksiyaniń grafigin siziń $f(x) = x^3 - 3x$

187. Funksiyaniń grafigin siziń $f(x) = x^2 - x^3$

188. Funksiyaniń grafigin siziń $f(x) = -x^4 + 4x^2$

189. Funksiyaniń grafigin siziń $f(x) = 1 - x - x^3$

190. Funksiyaniń grafigin siziń $f(x) = x^4 - x^3 + x^2$

191. Funksiyaniń grafigin siziń $f(x) = \frac{1}{x^2}$

192. Funksiyaniń grafigin siziń $f(x) = \frac{1}{x^3}$

193. Funksiyaniń grafigin siziń $f(x) = x + \frac{1}{x^2}$

194. Funksiyaniń grafigin siziń $f(x) = x^2 + \frac{1}{x}$

195. Funksiyaniń grafigin siziń $f(x) = \frac{1}{(x+1)^2}$

196. Funksiyaniń grafigin siziń $f(x) = \frac{1}{(x-1)^2}$

197. Funksiyaniń grafigin siziń $f(x) = \frac{1}{1-x^2}$

198. Funksiyaniń grafigin siziń $f(x) = \frac{x^2}{1+x^2}$

199. Funksiyaniń grafigin siziń $f(x) = \frac{3x-2}{5x^2}$

200. Funksiyaniń grafigin siziń $f(x) = \frac{2x}{x^2+1}$

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