**1. Namangan davlat universiteti 60540200-Amaliy matematika ta'lim yo'nalishi kunduzgi ta'lim shakli 1-bosqich talabalari uchun "Matematik analiz" fanidan 2024/2025 o'quv yili bahorgi semestrida o'tkaziladigan yakuniy nazorat uchun auditoriyada o'tilgan mavzular (ma'ruza, amaliy) yuzasidan nazorat savollar banki**

1. Aniq integralning ta'rifini keltiring.
2. Rimann yig'indisi orqali aniq integralni tushuntiring.
3. Aniq integralning geometrik ma'nosi nimadan iborat?
4. Newton-Leybnits formulasini keltiring va isbotlang.
5. Aniq integralning chiziqlilik xossasini tushuntiring.
6. Aniq integralning additivlik xossasini tushuntiring.
7. Aniq integralning taqqoslash xossasini tushuntiring.
8. Aniq integralning o'rtacha qiymati haqida gapiring.
9. Aniq integralning chegaraviy qiymatlarini hisoblash usullarini tushuntiring.
10. Aniq integral yordamida egri chiziqning uzunligini hisoblash usulini tushuntiring.
11. Aniq integral yordamida yuzani hisoblash usulini tushuntiring.
12. Aniq integral yordamida hajmni hisoblash usulini tushuntiring.
13. Aniq integral yordamida massa markazini hisoblash usulini tushuntiring.
14. Aniq integral yordamida statik momentni hisoblash usulini tushuntiring.
15. Aniq integral yordamida inersiya momentini hisoblash usulini tushuntiring
16. Fizikada ishni hisoblashda aniq integraldan qanday foydalaniladi?
17. Fizikada energiyani hisoblashda aniq integralning roli haqida gapiring.
18. Fizikada kuch momentini hisoblashda aniq integralning roli haqida gapiring.
19. Massa markazini hisoblashda aniq integralning roli haqida gapiring.
20. Statik momentni hisoblashda aniq integralning roli haqida gapiring.
21. Inersiya momentini hisoblashda aniq integralning roli haqida gapiring.
22. Aylana yuzini hisoblashda aniq integraldan qanday foydalaniladi?
23. Ellips yuzini hisoblashda aniq integraldan qanday foydalaniladi?
24. Parabola yuzini hisoblashda aniq integraldan qanday foydalaniladi?
25. Egri chiziqli trapetsiya yuzini hisoblashda aniq integraldan qanday foydalaniladi?
26. Aylanish jismlarining hajmini hisoblashda aniq integralning roli haqida gapiring.
27. Disk usuli orqali aylanish jismlarining hajmini hisoblash usulini tushuntiring.
28. Silindr usuli orqali aylanish jismlarining hajmini hisoblash usulini tushuntiring.
29. Qobiq usuli orqali aylanish jismlarining hajmini hisoblash usulini tushuntiring.
30. Fizikada tezlikni hisoblashda aniq integralning roli haqida gapiring.
31. Fizikada tezlanishni hisoblashda aniq integralning roli haqida gapiring.
32. Suyuqlik bosimini hisoblashda aniq integralning roli haqida gapiring.
33. Funksiyaning o'rtacha qiymatini hisoblashda aniq integralning roli haqida gapiring.
34. Funksiyaning o'rtacha kvadratik qiymatini hisoblashda aniq integralning roli haqida gapiring.
35. Aniq integralning muhandislikdagi tatbiqlariga misollar keltiring.
36. Sonli qatorning ta'rifini keltiring.
37. Sonli qatorning yaqinlashuvi va uzoklashuvi tushunchalarini tushuntiring.
38. Geometrik progressiya qatorining yaqinlashuvi shartini keltiring.
39. Garmonik qator haqida gapiring. U yaqinlashadimi yoki uzoklashadimi?
40. Musbat hadli qatorlarning yaqinlashuvini tekshirish uchun qo'llaniladigan taqqoslash mezonlarini tushuntiring.
41. Dalamber mezonini tushuntiring.
42. Koshining integral mezonini tushuntiring.
43. Koshining taqqoslash mezonini tushuntiring.
44. Leybnits mezonini tushuntiring.
45. Alternating (almashinuvchi) qatorlar haqida gapiring.
46. Absolyut yaqinlashuvchi qatorlar haqida gapiring.
47. Shartli yaqinlashuvchi qatorlar haqida gapiring.

48. Funksional qatorlar haqida gapiring.
49. Cheksiz ko‘paytma tushunchasini tushuntiring.
50. Cheksiz ko‘paytmalarning yaqinlashuvi haqida gapiring.
51. Cheksiz ko‘paytmalarning yaqinlashuvi uchun zarur shartni tushuntiring.
52. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirish uchun qanday mezonlar mavjud?
53. Cheksiz ko‘paytma va sonli qatorlar o‘rtasidagi bog‘liqlik haqida gapiring.
54. Cheksiz ko‘paytmalarning logarifmik shaklda ifodalanishi haqida gapiring.
55. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda taqqoslash mezonlarini qo‘llash mumkinmi?
56. Cheksiz ko‘paytmalarning kompleks tahlildagi ahamiyati haqida gapiring.
57. Cheksiz ko‘paytmalarning matematik modellashtirishdagi ahamiyati haqida gapiring.
58. Cheksiz ko‘paytmalarning fizikadagi ahamiyati haqida gapiring.
59. Cheksiz ko‘paytmalarning muhandislikdagi ahamiyati haqida gapiring.
60. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda limit alomatining ahamiyati haqida gapiring.
61. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda integral alomatining ahamiyati haqida gapiring.
62. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda nisbiy mezonning ahamiyati haqida gapiring.
63. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda mutlaq mezonning ahamiyati haqida gapiring.
64. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda Koshining alomatining ahamiyati haqida gapiring.
65. Cheksiz ko‘paytmalarning yaqinlashuvini tekshirishda D’Alamber alomatining ahamiyati haqida gapiring.

66. $\sum_{n=1}^{\infty} \frac{6}{9n^2+12n-5}$.

67. $\sum_{n=1}^{\infty} \frac{6}{9n^2+6n-8}$.

68. $\sum_{n=0}^{\infty} \frac{2}{4n^2+8n+3}$.

69. $\sum_{n=1}^{\infty} \frac{3}{9n^2+3n-2}$.

70. $\sum_{n=2}^{\infty} \frac{1}{n^2+n-2}$.

71. $\sum_{n=1}^{\infty} \frac{6}{36n^2-24n-5}$.

72 $\sum_{n=1}^{\infty} \frac{4}{4n^2+4n-3}$.

73. $\sum_{n=1}^{\infty} \frac{9}{9n^2+3n-20}$.

74. $\sum_{n=1}^{\infty} \frac{8}{16n^2-8n-15}$.

75. $\sum_{n=1}^{\infty} \frac{5}{25n^2+5n-6}$.

76. $\sum_{n=2}^{\infty} \frac{1}{n^2+n-2}$.

77. $\sum_{n=2}^{\infty} \frac{12}{36n^2+12n-35}$.

78 $\sum_{n=1}^{\infty} \frac{3}{9n^2-3n-2}$.

79. $\sum_{n=1}^{\infty} \frac{8}{16n^2+8n-15}$.

80. $\sum_{n=1}^{\infty} \frac{12}{36n^2-12n-35}$.

81. $\sum_{n=1}^{\infty} \frac{14}{49n^2-70n-24}$

82 $\sum_{n=3}^{\infty} \frac{4-5n}{n(n-1)(n-2)}$.

83. $\sum_{n=1}^{\infty} \frac{5n+3}{n(n+1)(n+3)}$.

Quyidagi qatorlarni yaqinlashishga tekshiring.

84. $\sum_{n=1}^{\infty} \frac{\sin^2 n\sqrt{n}}{n\sqrt{n}}$.

85. $\sum_{n=1}^{\infty} \frac{\cos^2(n\pi/2)}{n(n+1)(n+2)}$.

86. $\sum_{n=1}^{\infty} \frac{2+(-1)^n}{n-\ln n}$.

87. $\sum_{n=1}^{\infty} \frac{n(2+\cos n\pi)}{2n^2-1}$.

88. $\sum_{n=1}^{\infty} \frac{\sin^2 n}{n^2+1}$.

89. $\sum_{n=2}^{\infty} \frac{\arccos \frac{(-1)^n n}{n+1}}{n^2+2}$.

90. $\sum_{n=2}^{\infty} \frac{n\ln n}{n^2-3}$.

91. $\sum_{n=2}^{\infty} \frac{1}{\sqrt[4]{n^3}} \sin \frac{2+(-1)^n}{6}\pi$.

92. $\sum_{n=1}^{\infty} \frac{1+\sin \frac{\pi n}{2}}{n^2}$.

93. $\sum_{n=1}^{\infty} \frac{(2+\cos \frac{n\pi}{2})\sqrt{n}}{\sqrt[4]{n^7+5}}$.

94. $\sum_{n=1}^{\infty} \frac{\sin^2 2^n}{n^2}$.

95. $\sum_{n=1}^{\infty} \sqrt[3]{n} arctg \frac{1}{n^3}$.

96. $\int_{\pi/4}^{arctg3} \frac{dx}{(3\operatorname{tg} x+5)\sin 2x}$.

97. $\int_{0}^{\arccos\left(1/\sqrt{17}\right)} \frac{3+2\operatorname{tg}x}{2\sin^2 x+3\cos^2 x-1}dx.$

98. $\int_{0}^{\operatorname{arctg}(1/3)} \frac{(8+\operatorname{tg}x)}{18\sin^2 x+2\cos^2 x}dx.$

99. $\int_{\arcsin\left(1/\sqrt{37}\right)}^{\pi/4} \frac{6\operatorname{tg}x dx}{3\sin 2x+5\cos^2 x}.$

100. $\int_{-\operatorname{arctg}(1/3)}^{0} \frac{3\operatorname{tg}x+1}{2\sin 2x-5\cos 2x+1}dx.$

101. $\int_{\pi/4}^{\arccos\left(1/\sqrt{3}\right)} \frac{\operatorname{tg}x}{\sin^2 x-5\cos^2 x+4}dx.$

102. $\int_{0}^{\operatorname{arctg}3} \frac{4+\operatorname{tg}x}{2\sin^2 x+18\cos^2 x}dx.$

103. $\int_{0}^{\operatorname{arctg}(2/3)} \frac{6+\operatorname{tg}x}{9\sin^2 x+4\cos^2 x}dx.$

104. $\int_{0}^{\pi/4} \frac{7+3\operatorname{tg}x}{\left(\sin x+2\cos x\right)^2}dx.$

105. $\int_{-\arccos\left(1/\sqrt{10}\right)}^{0} \frac{3\operatorname{tg}^2 x-50}{2\operatorname{tg}x+7}dx.$

106. $\int_{\pi/4}^{\arcsin\left(2/\sqrt{5}\right)} \frac{4\operatorname{tg}x-5}{4\cos^2 x-\sin 2x+1}dx.$

107. $\int_{-\arccos\left(1/\sqrt{5}\right)}^{0} \frac{11-3\operatorname{tg}x}{\operatorname{tg}x+3}dx.$

108. $\int_{\pi/4}^{\arccos\left(1/\sqrt{26}\right)} \frac{dx}{\left(6-\operatorname{tg}x\right)\sin 2x}.$

109. $\int\limits_{-\arcsin(2/\sqrt{5})}^{\pi/4} \frac{2-\operatorname{tg}x}{(\sin x+3\cos x)^2}dx.$

110. $\int\limits_{\arccos(1/\sqrt{10})}^{\arccos(1/\sqrt{26})} \frac{12dx}{(6+5\operatorname{tg}x)\sin 2x}.$

111. $\int\limits_{0}^{\arccos(1/\sqrt{6})} \frac{3\operatorname{tg}^2 x-1}{\operatorname{tg}^2 x+5}.$

120. $\int\limits_{\pi/2}^{2\operatorname{arctg}2} \frac{dx}{\sin^2 x(1-\cos x)}.$

113. $\int\limits_{\pi/2}^{2\operatorname{arctg}2} \frac{dx}{\sin^2 x(1+\cos x)}.$

114. $\int\limits_{0}^{\pi/2} \frac{\cos x-\sin x}{(1+\sin x)^2}dx.$

115. $\int\limits_{2\operatorname{arctg}(1/3)}^{2\operatorname{arctg}(1/2)} \frac{dx}{\sin x(1-\sin x)}.$

116. $\int\limits_{0}^{\pi/2} \frac{\cos xdx}{5+4\cos x}.$

117. $\int\limits_{\pi/3}^{\pi/2} \frac{\cos xdx}{1+\sin x-\cos x}.$

118. $\int\limits_{0}^{\pi/2} \frac{\sin dx}{1+\sin x+\cos x}.$

119. $\int\limits_{0}^{\pi/2} \frac{\cos xdx}{1+\sin x+\cos x}.$

120. $\int\limits_{-2\pi/3}^{0} \frac{\cos xdx}{1+\cos x-\sin x}.$

**2. Namangan davlat universiteti 60540200-Amaliy matematika ta'lim yo'nalishi kunduzgi ta'lim shakli 1-bosqich talabalari uchun "Matematik analiz" fanidan 2024/2025 o'quv yili bahorgi**

**semestrida o'tkaziladigan yakuniy nazorat uchun mustaqil ta'lim mavzulari yuzasidan nazorat savollar banki**

1. Aniq integralning geometrik ma'nosi nimadan iborat?
2. Agar $f(x)$ funksiya $[a,b]$ oraliqda manfiy qiymatlar qabul qilsa, aniq integralning qiymati qanday talqin qilinadi?
3. Aniq integralning o'zgaruvchini almashtirish usuli haqida gapiring. Misol bilan tushuntiring.
4. Bo'laklab integrallash usuli aniq integralda qanday qo'llaniladi?
5. $f(x)$ funksiya $[a,b]$ oraliqda uzluksiz bo'lsa, uning boshlang'ich funksiyasi mavjudligini tushuntiring.
6. Aniq integral yordamida funksiyaning o'rtacha qiymatini topish formulasi nimadan iborat?
7. Parametrli integrallar haqida gapiring. Ularning hosilasi qanday hisoblanadi?
8. Aniq integral yordamida funksiyaning uzunligini hisoblash formulasi nimadan iborat?
9. Fizikada ish, energiya va kuch momentini hisoblashda aniq integraldan qanday foydalaniladi?
10. Massa markazini topishda aniq integralning roli haqida gapiring.
11. Aylana, ellips va parabola kabi egri chiziqlarning yuzalarini hisoblashda aniq integraldan qanday foydalaniladi?
12. Aylanish jismlarining hajmini hisoblashda qobiq usuli haqida gapiring.
13. Statik moment va inersiya momentini hisoblashda aniq integralning ahamiyati haqida gapiring.
14. Egri chiziqli trapetsiyaning yuzini hisoblashda aniq integraldan qanday foydalaniladi?
15. Funksiyaning o'rtacha qiymati va o'rtacha kvadratik qiymati tushunchalarini tushuntiring.
16. Aniq integral yordamida egri chiziqning uzunligini hisoblash formulasi nimadan iborat?
17. Fizikada tezlik va tezlanishni hisoblashda aniq integralning roli haqida gapiring.
18. Aniq integral yordamida suyuqlik bosimini hisoblash usulini tushuntiring
19. Sonli qatorning umumiy hadi nolga intilmasa, qatorning yaqinlashuvi haqida nima deyish mumkin?
20. Musbat hadli qatorlarning yaqinlashuvini tekshirish uchun qo'llaniladigan taqqoslash mezonlarini tushuntiring.
21. Alternating (almashinuvchi) qatorlar haqida gapiring. Leybnits mezonini tushuntiring.
22. Qatorlarning absolyut va shartli yaqinlashuvi tushunchalarini tushuntiring.
23. Funksional qatorlar haqida gapiring. Ularning yaqinlashuvi qanday tekshiriladi?
24. Kuch qatorlari haqida gapiring. Ularning yaqinlashuv radiusi qanday hisoblanadi?
25. Taylor va Makloren qatorlari haqida gapiring. Ularning funksiyalarni ifodalashdagi ahamiyati nimada?
26. Qatorlarning yaqinlashuvini tekshirishda integral alomatining ahamiyati haqida gapiring.
27. Cheksiz ko'paytma tushunchasini tushuntiring. U qanday sharoitlarda yaqinlashadi?
28. Cheksiz ko'paytmalarning yaqinlashuvini tekshirish uchun qanday mezonlar mavjud?
29. Cheksiz ko'paytma va sonli qatorlar o'rtasidagi bog'liqlik haqida gapiring.
30. Cheksiz ko'paytmalarning kompleks tahlildagi ahamiyati haqida gapiring.
31. Cheksiz ko'paytmalarning yaqinlashuvi uchun zarur shartni tushuntiring.
32. Cheksiz ko'paytmalarning logarifmik shaklda ifodalanishi haqida gapiring.
33. Cheksiz ko'paytmalarning yaqinlashuvini tekshirishda taqqoslash mezonlarini qo'llash mumkinmi?
34. Cheksiz ko'paytmalarning matematik modellashtirishdagi ahamiyati haqida gapiring.
35. Aniq integral va sonli qatorlar o'rtasidagi bog'liqlik haqida gapiring.
36. Cheksizlik tushunchasi matematik analizda qanday ahamiyatga ega?
37. Aniq integral va qatorlarning haqiqiy hayotdagi tatbiqlariga misollar keltiring.
38. Riemann integrali va Lebeg integrali o'rtasidagi farqni tushuntiring.
39. Matematik analizda limit tushunchasining ahamiyati haqida gapiring.
40. Funksiyalarning yaqinlashuvi va uzoklashuvi tushunchalarini tushuntiring.
41. Matematik analizda asosiy teoremalar (masalan, o'rtacha qiymat teoremasi, Taylor teoremasi) haqida gapiring.
42. Aniq integral va qatorlarning fizika va muhandislikdagi ahamiyati haqida gapiring.

43. Matematik analizda cheksiz kichik va cheksiz katta miqdorlar tushunchasini tushuntiring.
44. Matematik analizning asosiy tamoyillari haqida umumiy ma'lumot bering.
45. Sonli qatorning yaqinlashuvi va uzoklashuvi tushunchalarini tushuntiring.
46. Geometrik progressiya qatorining yaqinlashuvi shartini keltiring va isbotlang.
47. Garmonik qator haqida gapiring. U yaqinlashadimi yoki uzoklashadimi?
48. Qatorlarning yaqinlashuvini tekshirish uchun qo'llaniladigan asosiy mezonlar (masalan, D'Alamber, Koshining integral mezonlari) haqida gapiring.
49. Absolyut va shartli yaqinlashuvchi qatorlar tushunchasini tushuntiring.
50. Matematik analizda cheksizlik tushunchasi qanday ahamiyatga ega?

51. $\int_{\pi/4}^{\operatorname{arctg}3} \frac{4\operatorname{tg}x-5}{1-\sin 2x+4\cos^2 x}dx.$

52. $\int_{0}^{\arccos\sqrt{2/3}} \frac{\operatorname{tg}x+2}{\sin^2 x+2\cos^2 x-3}dx.$

53. $\int_{0}^{\pi/4} \frac{2\operatorname{tg}^2 x-11\operatorname{tg}x-22}{4-\operatorname{tg}x}dx.$

54. $\int_{\pi/4}^{\operatorname{arctg}3} \frac{1+\operatorname{ctg}x}{(\sin x+2\cos x)^2}dx.$

55. $\int_{0}^{\pi/4} \frac{6\sin^2 x}{3\cos 2x-4}dx.$

56. $\int_{0}^{\operatorname{arctg}2} \frac{12+\operatorname{tg}x}{3\sin^2 x+12\cos^2 x}dx.$

57. $\int_{0}^{\arcsin\sqrt{3/7}} \frac{\operatorname{tg}^2 x dx}{3\sin^2 x+4\cos^2 x-7}.$

58. $\int_{\arcsin(2/\sqrt{5})}^{\arcsin(3/\sqrt{10})} \frac{2\operatorname{tg}x+5}{(5-\operatorname{tg}x)\sin 2x}dx.$

59. $\int_{0}^{\pi/4} \frac{5\operatorname{tg}x+2}{2\sin 2x+5}dx.$

60. $\int_{0}^{\arcsin\sqrt{7/8}} \frac{6\sin^2 x}{4+3\cos 2x}dx.$

61. $\int_0^{\arcsin 3\sqrt{10}} \frac{2\operatorname{tg}x-5}{(4\cos x-\sin x)^2}dx.$

62. $\int_0^{\pi/4} \frac{4-7\operatorname{tg}x}{2+3\operatorname{tg}x}dx.$

63. $\int_{\pi/4}^{\arcsin\sqrt{2/3}} \frac{8\operatorname{tg}x\,dx}{3\cos^2 x+8\sin 2x-7}.$

64. $\int_0^{\pi/3} \frac{\operatorname{tg}^2 x}{4+3\cos 2x}dx.$

65. $\int_0^{\pi/2} \frac{\cos x\,dx}{2+\cos x}.$

66. $\int_{2\operatorname{arctg}(1/2)}^{\pi/2} \frac{\cos x\,dx}{(1-\cos x)^3}.$

67. $\int_{2\operatorname{arctg}2}^{2\operatorname{arctg}3} \frac{dx}{\cos x(1-\cos x)}.$

68. $\int_{2\operatorname{arctg}(1/2)}^{\pi/2} \frac{dx}{(1+\sin x-\cos x)^2}.$

69. $\int_0^{2\pi/3} \frac{1+\sin x}{1+\cos x+\sin x}dx.$

70. $\int_0^{\pi/2} \frac{(1+\cos x)dx}{1+\sin x+\cos x}.$

71. $\int_0^{2\operatorname{arctg}(1/2)} \frac{1+\sin x}{(1-\sin x)^2}dx.$

72. $\int_0^{2\operatorname{arctg}(1/3)} \frac{\cos x\,dx}{(1-\sin x)(1+\cos x)}.$

73. $\int_{-\pi/2}^{0} \frac{\cos x\,dx}{(1+\cos x-\sin x)^2}.$

74. $\int_0^{2\operatorname{arctg}(1/2)} \frac{(1-\sin x)\,dx}{\cos x(1+\cos x)}.$

75. $\int_0^{\pi/2} \frac{\sin x dx}{(1+\cos x+\sin x)^2}.$

76. $\int_{-2\pi/3}^{0} \frac{\cos^2 x dx}{(1+\cos x-\sin x)^2}.$

77. $\int_0^{2\pi/3} \frac{\cos^2 x dx}{(1+\cos x+\sin x)^2}.$

78. $\int_0^{\pi/2} \frac{dx}{(1+\cos x+\sin x)^2}.$

79. $\int_0^{\pi/4} \frac{dx}{\cos x(1+\cos x)}.$

80. $\int_0^1 x^2\sqrt{1-x^2}\,dx.$

81. $\int_0^3 \frac{dx}{(9+x^2)^{3/2}}.$

82. $\int_1^2 \frac{\sqrt{x^2-1}}{x^4}dx.$

83. $\int_0^{\sqrt{3}} \frac{dx}{\sqrt{(4-x^2)^3}}.$

84. $\int_0^2 \frac{x^2 dx}{\sqrt{16-x^2}}.$

85. $\int_0^4 \frac{dx}{(16+x^2)^{3/2}}.$

Funksiya grafiklari bilan chegaralangan yuzani hisoblang.

86. $y = x\sqrt{9-x^2}, \quad y = 0,$
$(0 \le x \le 3).$

87. $y = \sin x \cos^2 x, \quad y = 0,$
$(0 \le x \le \pi/2).$

88. $y = x^2\sqrt{4-x^2}, \quad y = 0,$
$(0 \le x \le 2).$

89. $y = \sqrt{e^x - 1}, \quad y = 0,$
$x = \ln 2.$

90. $y = \arccos x, \quad y = 0,$
$x = 0.$

Qutb koordinatalarida berilgan chiziqlar bilan chegaralangan figuralarning yuzalarini hisoblang

91. $r = 4\cos 3\varphi, \quad r = 2 \quad (r \ge 2).$

92. $r = \sqrt{3}\cos\varphi, \quad r = \sin\varphi,$
$(0 \le \varphi \le \pi/2).$

93. $r = 2\cos\varphi, \quad r = 2\sqrt{3}\sin\varphi,$
$(0 \le \varphi \le \pi/2).$

94. $r = 6\cos 3\varphi, \quad r = 3 \quad (r \ge 3).$

95. $r = \cos\varphi, \quad r = \sin\varphi,$
$(0 \le \varphi \le \pi/2).$

96. $r = \cos\varphi, \quad r = \sin\varphi,$
$(0 \le \varphi \le \pi/2).$

$r = \sqrt{2}\cos(\varphi - \pi/4),$

97. $r = \sqrt{2}\sin(\varphi - \pi/4),$

$(\pi/4 \le \varphi \le 3\pi/4).$

98. $r = \cos\varphi, \quad r = 2\cos\varphi.$

99. $r = \sin\varphi, \quad r = 2\sin\varphi.$

100. $r = 1 + \sqrt{2}\cos\varphi.$

101. $r = 1/2 + \cos\varphi.$

102. $r = 1 + \sqrt{2}\sin\varphi.$

103. $r = (5/2)\sin\varphi, \quad r = (3/2)\sin\varphi.$

104. $r = (3/2)\cos\varphi, \quad r = (5/2)\cos\varphi.$

105. $r = 4\cos 4\varphi.$

*Fan bo'yicha yakuniy nazorat savollari Matematika kafedrasining 2025 yil "28" fevraldagi 7 - son yig'ilishida muhokama etilgan va ma'qullangan.*

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