

Matematika kechki ta'lim yo'nalishi 2-kurs talabalari uchun "Oddiy differensial tenglamalar" fani bo'yicha

SAVOLNOMA

(3-semestr uchun)

1. Oddiy differensial tenglamalar nazariyasining asosiy tushunchalari
2. Oddiy differensial tenglamalar orqali ifodalanuvchi ayrim fizik masalalar
3. Oddiy differensial tenglamalar orqali ifodalanuvchi ayrim geometrik masalalar
4. O'zgaruvchilari ajralgan va unga keltiriladigan differensial tenglamalar
5. O'zgaruvchilariga nisbatan bir jinsli tenglamalar
6. Bir jinsli tenglamalarga keltiriladigan tenglamalar
7. Umumlashgan bir jinsli tenglamalar
8. Birinchi tartibli chiziqli tenglamalar. Ixtiyoriy o'zgarmaslarni variatsiyalash usuli
9. Birinchi tartibli chiziqli tenglamalar. Bernulli usuli
10. Birinchi tartibli chiziqli tenglamalar. Eyler usuli
11. Chiziqli tenglamalarga keltiriladigan tenglamalar. Bernulli tenglamasi
12. Rikkati tenglamasi
13. To'la differensial tenglamalar
14. Integrallovchi ko'paytuvchi: $\mu = \mu(x)$ bo'lgan holat
15. Integrallovchi ko'paytuvchi: $\mu = \mu(y)$ bo'lgan holat
16. Integrallovchi ko'paytuvchi: $\mu = \mu(\omega(x, y))$ bo'lgan holat
17. Birinchi tartibli tenglamalar uchun Koshi masalasi. Yechimning mavjudligi va yagonaligi haqidagi teorema
18. Ketma-ket yaqinlashishlar usuli
19. Yechimni davom ettirish. Davomsiz yechimlar
20. Yechimning boshlang'ich shartga va parametr ga uzluksiz bog'liqligi
21. Hosilaga nisbatan yechilmagan birinchi tartibli tenglamalar. Asosiy tushunchalar
22. Birinchi tartibli n -darajali differensial tenglamalar
23. To'liq emas tenglamalar
24. Parametr kiritishning umumiy sxemasi
25. Lagranj tenglamasi
26. Klero tenglamasi
27. Yechimning mavjudligi va yagonaligi haqidagi teorema
28. Maxsus yechimlar va ularni topish usullari
29. Yuqori tartibli differensial tenglamalar. Asosiy tushunchalar
30. Yuqori tartibli differensial tenglamalar uchun yechimning mavjudligi va yagonaligi haqidagi teorema
31. Yuqori tartibli differensial tenglamalarning kvadraturalarda integrallanadigan turlari
32. Yuqori tartibli differensial tenglamalarning tartibini pasaytirish. Noma'lum funksiya va uning dastlabki ketma-ket hosilalari qatnashmagan tenglamalar
33. Argument aniq turda qatnashmagan yuqori tartibli differensial tenglamalar
34. O'zgaruvchilarga nisbatan bir jinsli bo'lgan yuqori tartibli differensial tenglamalar
35. Umumlashgan bir jinsli yuqori tartibli differensial tenglamalar
36. Aniq hosilalardagi yuqori tartibli differensial tenglamalar
37. Tenglamani yeching: $x^2y' + 2xy - \ln x = 0$
38. Tenglamani yeching: $2xydx + (y^2 - x^2)dy = 0$
39. Tenglamani yeching: $(3x + 6xy + 3y^2)dx + (2x^2 + 3xy)dy = 0$

40. Tenglamani yeching: $y'^3 - y + x = 0$
41. Tenglamani yeching: $y' - y \cos x = y^2 \sin x$
42. Tenglamani yeching: $y^2 - 2xy + x^2 y' = 0$
43. Tenglamani yeching: $(x^3 + xy^2)dx + (x^2 y + y^3)dy = 0$
44. Tenglamani yeching: $(xy^2 + y)dx - xdy = 0$
45. Tenglamani yeching: $(x^2 + y)dx - xdy = 0$
46. Tenglamani yeching: $y = 2xy' + y'^2$
47. Tenglamani yeching: $x = \ln y' + \sin y'$
48. Tenglamani yeching: $y = 0,5y'^2 + \ln y'$
49. Tenglamani yeching: $xy'^3 = 1 + y'$
50. Tenglamani yeching: $x = y' \ln y'$
51. Tenglamani yeching: $y'^2 - 2xy' = 8x^2$
52. Tenglamani yeching: $xy' = e^x + xy$
53. Tenglamani yeching: $y' + \frac{y}{x} = 2 \ln x + 1$
54. Tenglamani yeching: $(y + \frac{2}{x^2})dx + (x - \frac{3}{y^2})dy = 0$
55. Tenglamani yeching: $\frac{y}{x}dx + (y^3 + \ln x)dy = 0$
56. Tenglamani yeching: $y' + \frac{2x}{1+x^2}y = 1 + x^2$
57. Tenglamani yeching: $(1+x)y' + y = \cos x$
58. Tenglamani yeching: $xy' = y + \sqrt{y^2 - x^2}$
59. Tenglamani yeching: $y' = \frac{y}{x} + \cos \frac{y}{x}$
60. Tenglamani yeching: $y' = \frac{y}{x} + \sin \frac{y}{x}$
61. Tenglamani yeching: $xy' = y + x \operatorname{tg} \frac{y}{x}$
62. Tenglamani yeching: $y' = \frac{y}{x} + \frac{x^2}{y}$
63. Tenglamani yeching: $y' = \frac{y}{2x} - \frac{1}{2y}$
64. Tenglamani yeching: $y^{IV} = x$
65. Tenglamani yeching: $y'' = 1 + (y')^2$
66. Tenglamani yeching: $2y'' = \frac{y'}{x} + \frac{x^2}{y'}$
67. Tenglamani yeching: $y'' = yy' - y'^2$
68. Tenglamani yeching: $xy'' = (1 + 2x^2)y'$
69. Tenglamani yeching: $x \ln x \cdot y'' = y'$

70. Tenglamani yeching: $xy'' = y' + x^2$
71. Tenglamani yeching: $xy'' = y' \ln \frac{y'}{x}$
72. Tenglamani yeching: $y''' = \sqrt{1 - (y'')^2}$
73. Tenglamani yeching: $y'' = (y')^2$
74. Tenglamani yeching: $y'' = \frac{1}{\sin^2 2x}$
75. Tenglamani yeching: $y''' = x + \cos x$
76. Tenglamani yeching: $y'' = 2x \ln x$
77. Tenglamani yeching: $y'' = \sqrt{1 - (y')^2}$
78. Tenglamani yeching: $y'' = \sqrt{1 + (y')^2}$
79. Tenglamani yeching: $xy''' - y'' = 0$
80. Tenglamani yeching: $xy'' + y' = 0$
81. Tenglamani yeching: $xy'' = y'$
82. Tenglamani yeching: $2yy'' = 1 + y'^2$
83. Tenglamani yeching: $y'' = \sin^3 x$
84. Tenglamani yeching: $(1 - x^2)y'' - xy' = 2$
85. Tenglamani yeching: $y''' x \ln x = y''$
86. Tenglamani yeching: $xy''' + y'' = 1$
87. Tenglamani yeching: $2xy''' = y''$
88. Tenglamani yeching: $xy''' + y'' = x + 1$
89. Tenglamani yeching: $y'' \operatorname{tg} x - y' + \frac{1}{\sin x} = 0$
90. Tenglamani yeching: $x^2 y'' + xy' = 1$
91. Tenglamani yeching: $y''' \operatorname{ctg} 2x + 2y'' = 0$
92. Tenglamani yeching: $(1 + x^2)y'' + 2xy' = x^3$
93. Tenglamani yeching: $y''' \operatorname{tg} x = 2y''$
94. Tenglamani yeching: $x^4 y'' + x^3 y' = 1$
95. Tenglamani yeching: $xy''' + 2y'' = 0$
96. Tenglamani yeching: $(1 + x^2)y'' + 2xy' = x^3$
97. Tenglamani yeching: $x^5 y''' + x^4 y'' = 1$
98. Tenglamani yeching: $xy''' + y'' + x = 0$
99. Tenglamani yeching: $xy''' + y'' = \sqrt{x}$
100. Tenglamani yeching: $y''' \operatorname{tg} 5x = 5y''$