УТВЕРЖДАЮ:
Первый проректор −
Проректор по учебной работе
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Дифференциальные уравнения

Индивидуальные задания к модулю 7.1

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В данной работе содержатся индивидуальные задания и мето-
дические указания, необходимые для выполнения работы.
Работа предназначена для студентов технических специально-
стей.

Текст печатается в авторской редакции

Содержание

Введение

Важной формой обучения студентов является самостоятельная работа над учебным материалом, которая состоит из следующих элементов: изучение материала по конспектам лекций и учебникам, решение задач, самопроверка усвоения материала, выполнение индивидуальных заданий расчетно-графических, контрольных работ и типовых расчетов. Студент должен помнить, что только при систематической и упорной самостоятельной работе можно овладеть приемами и методами решения задач по математике.

Перед решением каждой задачи надо полностью выписать ее условие. Решение задач следует излагать подробно и аккуратно, объясняя и мотивируя все действия по ходу решения и делая необходимые чертежи.

Для подготовки студента к защите выполненной работы представлен список литературы, отражающий в полной мере теоретический материал по данной теме и методические указания по выполнению индивидуальных заданий.

При защите работы студент обязан объяснить решение любого примера из задания.

Желаем успеха!

1. Индивидуальные задания

1.1. Задание 1

Проверьте, что указанная функция $y = y(x)$ является решением уравнения

№	Функция $y = y(x)$	Уравнение
1	$y = \dfrac{C\sqrt{1-x^2}+x}{\sqrt{1-x^2}-Cx}$	$y'\sqrt{1-x^2} = 1 + y^2$
2	$y = -\ln(\tilde{N} - e^x)$	$y' = e^{x+y}$
3	$y = C \cdot e^{\sqrt{1-x^2}}$	$y' = \dfrac{-xy}{\sqrt{1-x^2}}$
4	$y = C\sqrt{1+e^{2x}}$	$y'(1+e^{2x}) = ye^{2x}$
5	$y^3 + y - x^2 + C = 0$	$y'(3y^2 + 1) = 2x$
6	$y = \sqrt{Cx^2 - 1}$	$yx \cdot y' = 1 + y^2$
7	$y = \dfrac{C+x}{1-Cx}$	$y'(1+x^2) = 1 + y^2$
8	$y = 1 + \dfrac{Cx}{1+x}$	$y - 1 = (x^2 + x)\,y'$
9	$y = \sqrt{C(1-x^2) - 1}$	$y'y(x^2 - 1) = x(y^2 + 1)$
10	$y = \dfrac{C}{2(1+x^2)} - \dfrac{1}{2}$	$y'(1+x^2) + (2y+1)x = 0$
11	$y = \sqrt{C - 1 - \dfrac{C}{x^2+1}}$	$xy(1+x^2)\,y' = 1 + y^2$
12	$y = \ln(C(1+x^2) - 1)$	$e^y(1+x^2)\,y' = 2x(1+e^y)$
13	$y = (x+C)e^x$	$y' - y = e^x$
14	$y = Ce^x - x - 1$	$y' = x + y$
15	$y = 1 + C \cdot e^{-x^3/3}$	$y' + x^2 y = x^2$

№	Функция $y = y(x)$	Уравнение
16	$y = e^{C \cdot tg(x/2)}$	$y' \cdot \sin x = y \cdot \ln y$
17	$y - x = C(1 + xy)$	$1 + y^2 = (1 + x^2) y'$
18	$x^2(1 + y^2) = C$	$1 + y^2 + xy \cdot y' = 0$
19	$y = tg \ln Cx$	$1 + y^2 = xy'$
20	$\sqrt{1 + x^2} + \sqrt{1 + y^2} = C$	$x\sqrt{1 + y^2} + yy'\sqrt{1 + x^2} = 0$
21	$y = -\ln(1 + Ce^x)$	$e^{-y}(1 + y') = 1$
22	$1 + e^y = C(1 + x^2)$	$e^y(1 + x^2) y' = 2x(1 + e^y)$
23	$C + \dfrac{e^y}{y} = \ln(\ln x)$	$(1 - y)e^y \cdot y' + \dfrac{y^2}{x \ln x} = 0$
24	$2x^3 y^3 = 3x^2 + C$	$xy^2(xy' + y) = 1$
25	$3x^2 - 12x + 2x^3 y^3 + 6xy = C$	$x^2 y^3 + y + x - 2 + (x^3 y^2 + x) y' = 0$
26	$y^3 = Cx - \ln x - 1$	$\ln x + y^3 = 3xy^2 \cdot y'$
27	$y = \dfrac{Cx}{2õ + 1} + 2$	$y - xy' = 2(1 + x^2 y')$
28	$y = x \cdot \sin(\ln Cx)$	$xy' = \sqrt{x^2 - y^2} + y$
29	$y^2 - 3xy + 2x^2 = C$	$4x - 3y + y'(2y - 3x) = 0$
30	$y = (x^2 + C)e^{-x^2}$	$y' + 2xy = 2xe^{-x^2}$
31	$y = \dfrac{1}{4}(2x^2 + 2x - 1) + Ce^{-2x}$	$y' + 2y = x^2 + 2x$
32	$y = C\sqrt{x^2 + 2x - 1} + x$	$(x^2 + 2x - 1) y' - (x + 1) y = x - 1$
33	$y = -\left(\dfrac{1}{3}x^5 + Cx^2\right)^{-1}$	$xy' + 2y = x^5 y^2$
34	$y = \dfrac{C - x^3}{2x - 3}$	$(2x - 3) y' + 3x^2 + 2y = 0$

№	Функция $y = y(x)$	Уравнение
35	$y = \dfrac{2x}{1 + Cx^2}$	$y' = \dfrac{y^2}{x^2} - \dfrac{y}{x}$
36	$y = (x + C)\,e^{x^5}$	$y' - 5x^4 y = e^{x^5}$
37	$y = 2x\sqrt{x} + Cx$	$xy' - y = x\sqrt{x}$
38	$y = \dfrac{\arcsin x + C}{x}$	$\sqrt{1 - x^2}\,(xy' + y) = 1$
39	$y = \dfrac{C - e^{-x^2}}{2x^2}$	$y' + \dfrac{2y}{x} = \dfrac{e^{-x^2}}{x}$
40	$y = \ln x + \dfrac{C}{x}$	$xy' + y = \ln x + 1$
41	$y = \dfrac{1}{x(C + \ln x)}$	$y'x + y + xy^2 = 0$
42	$y = (1 + Ce^{x^2})^{-1/2}$	$y' + xy = xy^3$
43	$y = \dfrac{x^2}{2}\ln x - \dfrac{3}{4}x^2 + C_1 x + C_2$	$y'' = \ln x$
44	$y = \dfrac{-1}{4}\sin 2x + C_1 x + C_2$	$y'' = \sin 2x$
45	$y = C_1 x^3 + C_2$	$xy'' - 2y' = 0$
46	$y = C_1 \ln x + C_2$	$xy'' + y' = 0$
47	$y = C_1 x^2 + C_2$	$xy'' - y' = 0$
48	$y = C_1 \cos 3x + C_2 \sin 3x$	$y'' + 9y = 0$
49	$y = C_1 e^{3x} + C_2 e^{-3x}$	$y'' - 9y = 0$
50	$y = e^{4x}(C_1 + x) + C_2$	$y'' - 4y' = 4e^{4x}$
51	$y = C_1 e^{-2x} + C_2 e^{-x} + \dfrac{1}{4}e^{2x}$	$y'' + 3y' + 2y = 3e^{2x}$
52	$y = C_1 e^{-2x} + C_2 e^{-x} + \dfrac{5}{42}e^{5x}$	$y'' + 3y' + 2y = 5e^{5x}$
53	$y = C_1 \sin x + C_2 \cos x - \dfrac{1}{24}\sin 5x$	$y'' + y = \sin 5x$

№	Функция $y = y(x)$	Уравнение
54	$y = C_1 + C_2 e^x - \dfrac{x^2}{2} - 5x$	$y'' - y' = x + 4$
55	$y = \ln(C + e^x)$	$y' = e^{x-y}$
56	$y = C_1 + C_2 e^{-3x} + \dfrac{x}{3}$	$y'' + 3y' = 1$
57	$y = C_1 + C_2 e^{3x} - \dfrac{x^4}{12} - \dfrac{x^3}{9} - \dfrac{x^2}{9} - \dfrac{20x}{27}$	$y'' - 3y' = x^3 + 2$
58	$y = C_1 + C_2 e^{-x} + e^x \left(\dfrac{x}{2} - \dfrac{3}{4} \right)$	$y'' + y' = xe^x$
59	$y = \dfrac{C}{\cos x}$	$y' = y\,\mathrm{tg}\,x$
60	$y = \dfrac{-1}{3x + C}$	$y' = 3y^2$
61	$y = \sqrt{x^2 - Cx}$	$2xyy' = x^2 + y^2$
62	$y = x(C + \ln x)$	$xy' = x + y$
63	$y = -\ln(1 + Cx)$	$xy' + 1 = e^y$
64	$y = 3 + \dfrac{C}{x}$	$xy' + y = 3$
65	$y = \dfrac{e^x + C}{x}$	$xy' + y = e^x$
66	$y = Cx^3 - x^2$	$y' - \dfrac{3y}{x} = x$
67	$y = (x^2 + C)e^{-x^2}$	$y' + 2xy = 2xe^{-x^2}$
68	$y = Cx^2 e^{1/x} + x^2$	$y' + \dfrac{1 - 2x}{x^2} y = 1$
69	$y = Ce^{-x} + \dfrac{1}{2}(\sin x + \cos x)$	$y' + y = \cos x$

№	Функция $y = y(x)$	Уравнение
70	$y = \dfrac{C - \cos 2x}{2\cos x}$	$y'\cos x - y\sin x = \sin 2x$
71	$y = \ln x + \dfrac{C}{x}$	$xy' + y = \ln x + 1$
72	$y = \dfrac{C - e^{-x^2}}{2x^2}$	$y' + \dfrac{2y}{x} = \dfrac{e^{-x^2}}{x}$
73	$y = 2(\sin x - 1) + Ce^{-\sin x}$	$y' + y\cos x = \sin 2x$
74	$y = \dfrac{x^2}{4} + \dfrac{C}{x^2}$	$xy' + 2y = x^2$
75	$y = Cx^2 + e^x$	$y' - \dfrac{2}{x}y = \dfrac{e^x(x-2)}{x}$
76	$y = \dfrac{1}{(C - \ln x)x}$	$y'x + y = xy^2$
77	$y = \dfrac{e^{x^2/2}}{\sqrt{2x + C}}$	$y' - xy + y^3 e^{-x^2} = 0$
78	$y = -\left(x + \dfrac{1}{2} + Cx^{2x}\right)^{-\frac{1}{2}}$	$y + y' = xy^3$
79	$y = (Ce^{x^2} + x^2 + 1)^{-\frac{1}{2}}$	$y' + xy = x^3 y^3$
80	$y = \dfrac{x}{C - \ln x}$	$x^2 y' = y^2 + xy$
81	$y = \dfrac{1}{Cx + 1 + \ln x}$	$xy' + y = y^2 \ln x$
82	$y = C\ln x + x^3$	$x\ln x \cdot y' - y = x^3(3\ln x - 1)$
83	$y = C\sqrt{x} + x^2$	$2xy' - y = 3x^2$
84	$y = C(x + 1)^2 + \dfrac{1}{2}(x + 1)^4$	$(x + 1)y' = 2y + (x + 1)^4$
85	$y = (x^2 + C)e^{x^2}$	$y' - 2xy = 2xe^{x^2}$
86	$y^3 = Cx^2 + x^3$	$3xy^2 y' - 2y^3 = x^3$

№	Функция $y = y(x)$	Уравнение
87	$y = \dfrac{Cx}{x^3 + 1} + \dfrac{1}{x}$	$(x^5 + x^2)\,y' + (2x^4 - x)y = x^3 - 2$
88	$y = Cx\ln x + \sqrt{x}$	$2x\ln x \cdot y' - 2(1 + \ln x)y +$ $+ \sqrt{x}(2 + \ln x) = 0$
89	$y^4 = C(\sqrt{x} + \sqrt{x+1})$	$2y'\sqrt{x^2 + x} = y$
90	$y = e^{x+x^2} + Ce^x$	$y' - y = 2xe^{x+x^2}$
91	$y = -x\cos x + Cx$	$xy' = y + x^2 \cdot \sin x$
92	$y = \dfrac{x}{Cxe^{x^2} + 1}$	$x^2 y' + 2x^3 y = y^2(1 + 2x^2)$
93	$y = \dfrac{x^2}{2} + C$	$(y')^2 - (2x + y)\,y' + x^2 + xy = 0$
94	$y = \dfrac{C}{x}$	$(xy')^2 + 3xyy' + 2y^2 = 0$
95	$y = \dfrac{C}{2}x^2 + \dfrac{1}{2C}$	$x(y')^2 - 2yy' + 2x = 0$
96	$y = 2x^2 + C$	$(y')^2 - 2xy' - 8x^2 = 0$
97	$y = x - \dfrac{1}{x + C}$	$y' = (x - y)^2 + 1$
98	$y = 2x - \dfrac{x^2}{2} + 2\ln(1 - x) + C$	$x^2 + xy' = 3x + y'$
99	$y^2 = Cx^2 + x^4$	$xyy' - y^2 = x^4$
100	$y = C(2x - 1) + \dfrac{1}{x}$	$x^2(2x - 1)\,y' - 2x^2 y = 1 - 4x$

1.2. Задание 2

Найдите общий интеграл дифференциального уравнения

1. $4xdx - 3ydy = 3x^2ydy - 2xy^2dx$

2. $x\sqrt{1+y^2} + yy'\sqrt{1+x^2} = 0$

3. $\sqrt{4+y^2}\,dx - ydy = x^2ydy$

4. $\sqrt{3+y^2}\,dx - ydy = x^2ydy$

5. $6xdx - 6ydy = 2x^2ydy - 3xy^2dx$

6. $(e^{2x} + 5)dy + ye^{2x}dx = 0$

7. $x\sqrt{3+y^2}\,dx + y\sqrt{2+x^2}\,dy = 0$

8. $y'y\sqrt{\dfrac{1-x^2}{1-y^2}} + 1 = 0$

9. $6xdx - 6ydy = 3x^2ydy - 2xy^2dx$

10. $x\sqrt{5+y^2}\,dx + y\sqrt{4+x^2}\,dy = 0$

11. $y(4+e^x)dy - e^xdx = 0$

12. $\sqrt{4-x^2}\,y' + xy^2 + x = 0$

13. $2xdx - 2ydy = x^2ydy - 2xy^2dx$

14. $x\sqrt{4+y^2}\,dx + y\sqrt{1+x^2}\,dy = 0$

15. $(e^x + 8)dy - ye^xdx = 0$

16. $\sqrt{5+y^2} + y'y\sqrt{1-x^2} = 0$

17. $6xdx - ydy = yx^2dy - 3xy^2dx$

18. $y\ln y + xy' = 0$

19. $(1+e^x)y' = ye^x$

20. $\sqrt{1-x^2}\,y' + xy^2 + x = 0$

21. $6xdx - 2ydy = 2yx^2dy - 3xy^2dx$

22. $y(1 + \ln y) + xy' = 0$

23. $(3 + e^x)yy' = e^x$

24. $\sqrt{3 + y^2} + \sqrt{1 - x^2}\, yy' = 0$

25. $xdx - ydy = yx^2dy - xy^2dx$

26. $\sqrt{5 + y^2}\, dx + 4(x^2y + y)dy = 0$

27. $(1 + e^x)yy' = e^x$

28. $3(x^2y + y)dy + \sqrt{2 + y^2}\, dx = 0$

29. $2xdx - ydy = yx^2dy - xy^2dx$

30. $2x + 2xy^2 + \sqrt{2 - x^2}\, y' = 0$

31. $x + xy + y'(y + xy) = 0$

32. $y - xy' = 1 + x^2y'$

33. $(1 + y^2)dx = (1 + x^2)dy$

34. $(xy^2 + x)dx + (y - x^2y)dy = 0$

35. $(1 + 2y)xdx + (1 + x^2)dy = 0$

36. $xy(1 + x^2)y' = 1 + y^2$

37. $e^y(1 + x^2)dy - 2x(1 + e^y)dx = 0$

38. $y' = (2y + 1)\text{ctg}x$

39. $x^2y' + y^2 = 0$

40. $xy' = \dfrac{y}{\ln x}$

41. $y'\text{tg}x - y = 1$

42. $y'\sin x = y\ln y$

43. $(2x + 1)dy = y^2dx$

44. $3e^x\text{tg}ydx + \dfrac{(2 - e^x)}{\cos^2 y}dy = 0$

45. $y'\sin x = y\ln y$

46. $x\sqrt{1 - y^2}dx + y\sqrt{1 - x^2}dy = 0$

47. $e^{-y}(1+y') = 1$

48. $y \ln y dx + x dy = 0$

49. $e^{y}(1+x^2)dy - 2x(1+e^y)dx = 0$

50. $xy dx + \sqrt{1-x^2} dy = 0$

51. $y' + \dfrac{x \sin x}{y \cos y} = 0$

52. $ye^{2x}dx - (1+e^{2x})dy = 0$

53. $2e^x \cdot ctgy dx + (1+e^x) \cdot \dfrac{1}{\sin^2 y} dy = 0$

54. $(3y^2+1)dy = 2x dx$

55. $y' \cos x = \dfrac{y}{\ln y}$

56. $y' = tgx \cdot tgy$

57. $\ln x dx + x tgy dy = 0$

58. $yy' + xe^y = 0$

59. $e^{1+x^2} tgy dx - \dfrac{e^{2x}}{x-1} dy = 0$

60. $(1+e^{2x}) y^2 dy = e^x dx$

61. $y' = 2^{x-y}$

62. $y \ln^3 y + y'\sqrt{1+x} = 0$

63. $xy = y' \ln y$

64. $\dfrac{x dx}{\sqrt{1-y^2}} + \dfrac{y dy}{\sqrt{1-x^2}} = 0$

65. $yy' = -\dfrac{2x}{\cos y}$

66. $y' = e^{x+y} + e^{x-y}$

67. $\dfrac{dx}{x(y-1)} + \dfrac{dy}{y(x+2)} = 0$

68. $x(y^6 + 1)dx + y^2(x^4 + 1)dy = 0$

69. $(\sqrt{xy} - \sqrt{x})dx + (\sqrt{xy} + \sqrt{y})dy = 0$

70. $\dfrac{1 + \cos 2x}{1 + \sin y} + y' = 0$

71. $\dfrac{4 + y^2}{\sqrt{x^2 + 2x + 5}} = \dfrac{3y + 2}{x + 1}y'$

72. $\dfrac{tgy\,dx}{\cos^2 x} + \dfrac{tgx\,dy}{\cos^2 y} = 0$

73. $5e^x tgy\,dx + \dfrac{(1 - e^x)dy}{\cos^2 y} = 0$

74. $\dfrac{\cos^2 x}{3\sin y} + 4y' = 0$

75. $(x + 2xy)dy + (y^2 + 4xy^2)dx = 0$

76. $(1 + e^{4x})yy' = e^{4x}$

77. $\sqrt{\dfrac{3 + y^2}{4 - x^2}} \cdot y' = 2$

78. $\sqrt{y^2 - 3} + \sqrt{1 + x^2} \cdot yy' = 0$

79. $y' = \dfrac{\cos x - \sin x + 1}{\cos y - \sin y - 1}$

80. $(xy^2 + 4x)dy + (x^2 y - 9y)dx = 0$

81. $y'ctgx = y + 3$

82. $y'tgx = y - 1$

83. $\dfrac{x^2 + 9}{y^2 + 4} + y' = 0$

84. $\dfrac{xy'}{y^2 - 4} + \dfrac{x^2 + 1}{y} = 0$

85. $(y + 1)\ln(y + 1) = y' \cdot (x^2 + 2x)$

86. $\quad xe^{x^2} \cdot (y+3) + y' = 0$

87. $\quad x^2 e^{x^3+2} \cdot (y^2 + 4y) = y'$

88. $\quad xy^2 + \sqrt{x^2 + 8}\, y' = 0$

89. $\quad y' \sin x = y \ln^2 y$

90. $\quad (x^2 + 4x - 2) + (y^2 + 4y + 7)\, y' = 0$

91. $\quad y' \operatorname{ctg} x + y = 1$

92. $\quad y' \operatorname{tg} x = y^2 + 4$

93. $\quad y + x^2 y' = 4 + y'$

94. $\quad \dfrac{x}{y}(1 + y^2)\, y' = 1 - x^2$

95. $\quad \dfrac{y}{x}(4 + x^2)\, y' = 5 + y^2$

96. $\quad y' = (2y + 1)\, e^{4x}$

97. $\quad y + 6 = \dfrac{x}{y} \cdot y'$

98. $\quad y' = \dfrac{xy + x}{x^2 y + y}$

99. $\quad (x^2 + 9)\, y' = y^2$

100. $\quad y^2 + 2xy' = 4 - x^2 y'$

1.3. Задание 3

Найдите общий интеграл дифференциального уравнения

1.	$y' = \dfrac{y^2}{x^2} + 4\dfrac{y}{x} + 2$	2.	$xy' = \dfrac{3y^3 + 2yx^2}{2y^2 + x^2}$
3.	$y' = \dfrac{x + y}{x - y}$	4.	$xy' = \sqrt{x^2 + y^2} + y$

5.	$2y' = \dfrac{y^2}{x^2} + 6\dfrac{y}{x} + 3$	6.	$xy' = \dfrac{3y^3 + 4yx^2}{2y^2 + 2x^2}$
7.	$y' = \dfrac{x + 2y}{2x - y}$	8.	$xy' = 2\sqrt{x^2 + y^2} + y$
9.	$3y' = \dfrac{y^2}{x^2} + 8\dfrac{y}{x} + 4$	10.	$xy' = \dfrac{3y^3 + 6yx^2}{2y^2 + 3x^2}$
11.	$y' = \dfrac{x^2 + xy - y^2}{x^2 - 2xy}$	12.	$xy' = \sqrt{2x^2 + y^2} + y$
13.	$y' = \dfrac{y^2}{x^2} + 6\dfrac{y}{x} + 6$	14.	$xy' = \dfrac{3y^3 + 8yx^2}{2y^2 + 4x^2}$
15.	$y' = \dfrac{x^2 + 2xy - y^2}{2x^2 - 2xy}$	16.	$xy' = 3\sqrt{x^2 + y^2} + y$
17.	$2y' = \dfrac{y^2}{x^2} + 8\dfrac{y}{x} + 8$	18.	$xy' = \dfrac{3y^3 + 10yx^2}{2y^2 + 5x^2}$
19.	$y' = \dfrac{x^2 + 3xy - y^2}{3x^2 - 2xy}$	20.	$xy' = 3\sqrt{2x^2 + y^2} + y$
21.	$y' = \dfrac{y^2}{x^2} + 8\dfrac{y}{x} + 12$	22.	$xy' = \dfrac{3y^3 + 12yx^2}{2y^2 + 6x^2}$
23.	$y' = \dfrac{x^2 + xy - 3y^2}{x^2 - 4xy}$	24.	$xy' = 2\sqrt{3x^2 + y^2} + y$
25.	$4y' = \dfrac{y^2}{x^2} + 10\dfrac{y}{x} + 5$	26.	$xy' = \dfrac{3y^3 + 14yx^2}{2y^2 + 7x^2}$
27.	$y' = \dfrac{x^2 + xy - 5y^2}{x^2 - 6xy}$	28.	$xy' = 4\sqrt{x^2 + y^2} + y$
29.	$3y' = \dfrac{y^2}{x^2} + 10\dfrac{y}{x} + 10$	30.	$xy' = 4\sqrt{2x^2 + y^2} + y$
31.	$xy' = y\ln\dfrac{y}{x}$	32.	$(\sqrt{xy} - x)\,y' + y = 0$

33.	$(y + \sqrt{x^2 + y^2}) = xy'$	34.	$y' = \dfrac{y}{x} + \cos\dfrac{y}{x}$
35.	$y' = \dfrac{y}{x} + \dfrac{x}{y}$	36.	$y' = \dfrac{x^2 + 2xy - 5y^2}{2x^2 - 6xy}$
37.	$(x - y)dx + xdy = 0$	38.	$(x + y)dy = (x - y)dx$
39.	$(2x - y)dx + (2y - x)dx = 0$	40.	$ydx - (2x + y)dy = 0$
41.	$(x + y)dx + (2x + 5y)dy = 0$	42.	$(x + 2y)dx + ydy = 0$
43.	$xy'\sin\dfrac{y}{x} + x = y\sin\dfrac{y}{x}$	44.	$xy + y^2 = (2x^2 + xy)\,y'$
45.	$xy'\ln\dfrac{y}{x} = x + y\ln\dfrac{y}{x}$	46.	$xyy' = y^2 + 2x^2$
47.	$xy' - y = x\,\mathrm{tg}\dfrac{y}{x}$	48.	$y' = 4 + \dfrac{y}{x} + \left(\dfrac{y}{x}\right)^2$
49.	$(x^2 + y^2)dx - xydy = 0$	50.	$xy' = xe^{y/x} + y$
51.	$xy' - y = \dfrac{x}{\mathrm{arctg}\, y/x}$	52.	$xy' = 2(y - \sqrt{xy})$
53.	$xy' = \sqrt{x^2 - y^2} + y$	54.	$4x - 3y + y'(2y - 3x) = 0$
55.	$xy' = y + \sqrt{y^2 - x^2}$	56.	$y' = \dfrac{2xy}{3x^2 + y^2}$
57.	$-xy + y^2 + y'(x^2 - xy + 4y^2) =$	58.	$xy' = \sqrt{y^2 + x^2} + y$
59.	$xy - 2y^2 + y'(-x^2 + 2xy + y^2) =$	60.	$3x + y + y'x = 0$
61.	$2xy'(x^2 + y^2) = y(y^2 + 2x^2$	62.	$y'x \cdot \cos\dfrac{y}{x} = y\cos\dfrac{y}{x} - x$
63.	$(3y - 7x)dx - (3x - 7y)dy =$	64.	$y^3 y' + 3y^2 x + 2x^3 = 0$
65.	$(2x - 4y)dx + (x + y)dy = 0$	66.	$y + (2\sqrt{xy} - x)\,y' = 0$

67.	$(3x - y)dx + (x - 6y)dy = 0$	68.	$y' = \dfrac{y^2}{x^2} - \dfrac{y}{x}$
69.	$xy' - y = \dfrac{x}{\sin\dfrac{y}{x}}$	70.	$xy' = 3(y + \sqrt{xy})$
71.	$xy' = y + 4\sqrt{x^2 + y^2}$	72.	$x^2 y' = x^2 + y^2 + 3xy$
73.	$y' = \dfrac{y^2}{x^2} + \dfrac{3y}{x}$	74.	$xy'\sin\dfrac{y}{x} + x = y\sin\dfrac{y}{x}$
75.	$xy' = \sqrt{2x^2 + y^2} + y$	76.	$y' = \dfrac{x + 7y}{9x - y}$
77.	$y' = \dfrac{3y^2 + 10xy}{2y^2 + 5x^2}$	78.	$y' = \dfrac{y}{x} + \dfrac{y}{x}\cdot\ln\dfrac{y}{x}$
79.	$y' - \dfrac{y}{x} = \dfrac{1}{\ln\dfrac{y}{x}}$	80.	$y' - \dfrac{y}{x} = \dfrac{1}{\cos\dfrac{y}{x}}$
81.	$xy' = y - \dfrac{x}{\sin\dfrac{y}{x}}$	82.	$x^2 y' = yx + y^2 + x^2$
83.	$xy' = \sqrt{x^2 - 4y^2} + y$	84.	$(x + y)dx + ydy = 0$
85.	$xy' - y = \dfrac{x}{e^{y/x}}$	86.	$xy' = y + 7x\,\mathrm{tg}\dfrac{y}{x}$
87.	$xy' = 6x\,\mathrm{ctg}\dfrac{y}{x} + y$	88.	$y - xy' = \sqrt{x^2 + y^2}$
89.	$y' = \dfrac{y}{x} + \sin\dfrac{y}{x}$	90.	$y' = \dfrac{y}{x} - \mathrm{ctg}\dfrac{y}{x}$
91.	$y' = \dfrac{y}{x} + \dfrac{4x^2}{y^2}$	92.	$y' - \dfrac{y}{x} = 5^{y/x}$
93.	$xy' = y + \dfrac{x}{10^{y/x}}$	94.	$y' = \dfrac{y^2}{x^2} + \dfrac{y}{x} + 4$

95.	$y' - \dfrac{y}{x} = \dfrac{y^2}{x^2} - 9$	96.	$y'x = y + x\cos^2\dfrac{y}{x}$
97.	$y' - \dfrac{y}{x} + \sin^2\dfrac{y}{x} = 0$	98.	$y' = \dfrac{y^2 + 5xy + x^2}{x^2}$
99.	$y' = \dfrac{y}{x} - \dfrac{1}{y/x \cdot 7^{y/x}}$	100.	$y'x = y - 2x\sin^2\dfrac{y}{x}$

1.4. Задание 4

Найдите решение задачи Коши

1. $y' - \dfrac{y}{x} = x^2, \quad y(1) = 0$

2. $y' - y\,\mathrm{ctg}\,x = 2x\sin x, \quad y\left(\dfrac{\pi}{2}\right) = 0$

3. $y' + y\cos x = \dfrac{1}{2}\sin 2x, \quad y(0) = 0$

4. $y' + y\,\mathrm{tg}\,x = \cos^2 x, \quad y\left(\dfrac{\pi}{4}\right) = \dfrac{1}{2}$

5. $y' - \dfrac{y}{x+2} = x^2 + 2x, \quad y(-1) = \dfrac{3}{2}$

6. $y' - \dfrac{1}{x+1}y = e^x(x+1), \quad y(0) = 1$

7. $y' - \dfrac{y}{x} = x\sin x, \quad y\left(\dfrac{\pi}{2}\right) = 1$

8. $y' + \dfrac{y}{x} = \sin x, \quad y(\pi) = \dfrac{1}{\pi}$

9. $y' + \dfrac{y}{2x} = x^2, \quad y(1) = 1$

10. $y' + \dfrac{2x}{1+x^2}y = \dfrac{2x^2}{1+x^2}, \quad y(0) = \dfrac{2}{3}$

11. $y' - \dfrac{2x-5}{x^2}y = 5, \quad y(2) = 4$

12. $\quad y' + \dfrac{y}{x} = \dfrac{x+1}{x}e^x, \quad y(1) = e$

13. $\quad y' - \dfrac{y}{x} = -2\dfrac{\ln x}{x}, \quad y(1) = 1$

14. $\quad y' - \dfrac{y}{x} = \dfrac{-12}{x^3}, \quad y(1) = 4$

15. $\quad y' + \dfrac{2}{x}y = x^3, \quad y(1) = \dfrac{-5}{6}$

16. $\quad y' + \dfrac{y}{x} = 3x, \quad y(1) = 1$

17. $\quad y' - \dfrac{2xy}{1+x^2} = 1 + x^2, \quad y(1) = 3$

18. $\quad y' + \dfrac{1-2x}{x^2}y = 1, \quad y(1) = 1$

19. $\quad y' + \dfrac{3y}{x} = \dfrac{2}{x^3}, \quad y(1) = 1$

20. $\quad y' + 2xy = -2x^3, \quad y(1) = e^{-1}$

21. $\quad y' + \dfrac{xy}{2(1-x^2)} = \dfrac{x}{2}, \quad y(0) = \dfrac{2}{3}$

22. $\quad y' + xy = -x^3, \quad y(0) = 3$

23. $\quad y' - \dfrac{2}{x+1}y = e^x(x+1)^2, \quad y(0) = 1$

24. $\quad y' + 2xy = xe^{-x^2}\sin x, \quad y(0) = 1$

25. $\quad y' - \dfrac{2y}{x+1} = (x+1)^3, \quad y(0) = \dfrac{1}{2}$

26. $\quad y' - y\cos x = -\sin 2x, \quad y(0) = 3$

27. $\quad y' - 4xy = -4x^3, \quad y(0) = \dfrac{-1}{2}$

28. $\quad y' - \dfrac{y}{x} = \dfrac{\ln x}{x}, \quad y(1) = 1$

29. $\quad y' - 3x^2 y = \dfrac{x^2(1+x^3)}{3}, \quad y(0) = 0$

30. $y' - y\cos x = \sin 2x, \quad y(0) = -1$

31. $y'\operatorname{tg}x - y + \dfrac{1}{\sin x} = 0, \quad y\left(\dfrac{\pi}{2}\right) = 1$

32. $(1 + x^2)y' + 2xy = x^3, \quad y(0) = 1$

33. $xy' - y + \dfrac{1}{x} = 0, \quad y(1) = 0$

34. $\operatorname{cth}x \cdot y' - y + \dfrac{1}{\operatorname{ch}x} = 0, \quad y(0) = 2$

35. $xy' + y = 1, \quad y(1) = 2$

36. $(x + 1)y' + y = x + 1, \quad y(1) = 3$

37. $xy' + y = \dfrac{1}{\sqrt{x}}, \quad y(1) = 4$

38. $x^3 y' + x^2 y = 1, \quad y(1) = 0$

39. $x^2 y' + xy = 1, \quad y(1) = 1$

40. $-xy' + 2y = \dfrac{2}{x^2}, \quad y(1) = 1$

41. $x^4 y' + x^3 y = 4, \quad y(1) = 0$

42. $\operatorname{cth}x \cdot y' + y = \operatorname{ch}x, \quad y(0) = 0$

43. $y' + \dfrac{2x}{x^2 + 1}y = 2x, \quad y(0) = 0$

44. $y' + x^2 y = x^2, \quad y(0) = -1$

45. $xy' + y = e^x, \quad y(1) = e$

46. $y' + 2xy = 2xe^{-x^2}, \quad y(0) = 4$

47. $xy' + y = \ln x + 1, \quad y(1) = -3$

48. $x^2 y' + y + e^{2/x} = 0, \quad y(2) = e$

49. $xy' - 2y = x^4 e^x, \quad y(1) = 0$

50. $x^2 y' + xy = 1, \quad y(e) = 1$

51. $y' + 2yx = 8x^3 + 8x, \quad y(0) = 0$

52. $\sin x \cos x \cdot y' + y = \cos 2x \cdot \cos^2 x, \quad y\left(\dfrac{\pi}{3}\right) = \dfrac{1}{4}$

53. $x \cos^2 x \cdot y' - \cos^2 x \cdot y = -x^2, \quad y\left(\dfrac{\pi}{4}\right) = \pi$

54. $y' - 2xy = x, \quad y(0) = 0$

55. $4xy' + y = 104x^3, \quad y(1) = 8$

56. $y' + xy = x^3, \quad y(0) = -1$

57. $xy' + 2y = 3x \cos 2x - 2x^2 \sin 2x, \quad y\left(\dfrac{\pi}{4}\right) = 16$

58. $y' - 8xy = 32x^3 - 8x, \quad y(0) = 0$

59. $xy' - y = 2\ln x - \ln^2 x, \quad y(e^2) = 4$

60. $xy' - 2y = x^4, \quad y(-1) = -2$

61. $xy' + 3y = \dfrac{x+2}{x^2(x-1)}, \quad y(2) = \dfrac{1}{4}$

62. $2x^2 y' + y = -e^{1/x}, \quad y(1) = e$

63. $x^2 y' + xy = -\sqrt{x}, \quad y(4) = -0{,}5$

64. $y' \cdot \sin 2x - 2y = \sin^2 2x - 2\sin^2 x, \quad y\left(\dfrac{\pi}{4}\right) = -0{,}5$

65. $y' + \dfrac{y}{x} = x^2 + 2x, \quad y(1) = \dfrac{11}{12}$

66. $2x\sqrt{x}\, y' - 6y\sqrt{x} = 7, \quad y(1) = -4$

67. $y' + \dfrac{y}{x} = \sin x + 3\cos x, \quad y\left(\dfrac{\pi}{2}\right) = \dfrac{2}{\pi}$

68. $y' \sin 2x + 2y = 2\cos^2 x, \quad y\left(\dfrac{5\pi}{4}\right) = \dfrac{3}{2}$

69. $y' \mathrm{ch}\, x - y\, \mathrm{sh}\, x = 1, \quad y(0) = 1$

70. $4xy' + y = 13x^3, \quad y(1) = 5$

71. $x^2 y' + 2xy = \dfrac{2}{x^2 + 4}, \quad y(2) = \dfrac{\pi}{8}$

72. $xy' + 2y = 2\ln^2 x - \ln x, \quad y(1) = 2$

73. $2x^2 y' + 2xy = -\sqrt{x}, \quad y(1) = -0{,}5$

74. $xy' + 2y = 2\sin^2 x - x\sin 2x, \quad y\!\left(\dfrac{\pi}{4}\right) = \dfrac{3}{2}$

75. $y' - 2xy = 2x^3 - 2x, \quad y(0) = -2$

76. $y' - y\,\mathrm{tg}\,x = 2x - x^2\,\mathrm{tg}\,x, \quad y(\pi) = 0$

77. $4x^2 y' + y = -e^{\frac{1}{2x}}, \quad y(0{,}5) = e$

78. $y' + 2y = 2\cos^2 x - \sin 2x, \quad y(0) = -1$

79. $y' - \dfrac{3y}{x} = x, \quad y(1) = 2$

80. $y'\cos x - y\sin x = \sin 2x, \quad y(0) = 4$

81. $xy' + 2y = e^{-x^2}, \quad y(-1) = \dfrac{-1}{2e}$

82. $y' + y\cos x = \sin 2x, \quad y(0) = 0$

83. $y' - y\,\mathrm{tg}\,x = \mathrm{ctg}\,x, \quad y\!\left(\dfrac{\pi}{3}\right) = 1 - \ln 3$

84. $xy' + y = (x + 1)e^x, \quad y(1) = e$

85. $xy' + y = \ln x + 1, \quad y(1) = 3$

86. $y' + 2xy = 2xe^{-x^2}, \quad y(0) = -1$

87. $xy' + 2y = x^2, \quad y(2) = 2$

88. $y' - \dfrac{2}{x}y = e^x(x^3 - 2x^2), \quad y(1) = -2e$

89. $xy' - y = x^2\cos x, \quad y\!\left(\dfrac{\pi}{2}\right) = \dfrac{\pi}{2}$

90. $y' - \dfrac{y}{x\ln x} = x\ln x, \quad y(e) = \dfrac{e^2}{2}$

91. $y' \sin x - y \cos x = 1, \quad y\left(\dfrac{\pi}{2}\right) = 0$

92. $xy' + y = x^2, \quad y(3) = 3$

93. $y' + 3y\,\mathrm{tg}\,3x = \sin 6x, \quad y(0) = \dfrac{1}{3}$

94. $x^2 y' - 2xy = 3, \quad y(1) = 0$

95. $xy' - 2y = x^4, \quad y(2) = 0$

96. $y' - \dfrac{y}{\sin x} = \mathrm{tg}^2\left(\dfrac{x}{2}\right), \quad y\left(\dfrac{\pi}{3}\right) = \dfrac{2\ln 2}{\sqrt{3}}$

97. $y' - 2y = e^x - x, \quad y(0) = 0{,}25$

98. $y' - \dfrac{2y}{x+1} = e^x (x+1)^2, \quad y(0) = -2$

99. $y' - y\,\mathrm{tg}\,x = \dfrac{1}{\cos x}, \quad y(0) = 0$

100. $(1 + x^2)\,y' - 2xy = (1 + x^2)^2, \quad y(1) = 2$

1.5. Задание 5

Найдите решение задачи Коши

1. $y' + xy = (1 + x)e^{-x} y^2, \quad y(0) = 1$

2. $xy' + y = 2y^2 \ln x, \quad y(1) = 0{,}5$

3. $2(xy' + y) = xy^2, \quad y(1) = 2$

4. $y' + 4x^3 y = 4(x^3 + 1)e^{-4x} y^2, \quad y(0) = 1$

5. $xy' - y = -y^2 (\ln x + 2)\ln x, \quad y(1) = 1$

6. $2(y' + xy) = (1 + x)e^{-x} y^2 \quad y(0) = 2$

7. $3(xy' + y) = y^2 \ln x, \quad y(1) = 3$

8. $2y' + y \cos x = y^{-1} \cos x (1 + \sin x), \quad y(0) = 1$

9. $y' + 4x^3 y = 4y^2 e^{4x}(1 - x^3), \quad y(0) = -1$

10. $3y' + 2xy = 2xy^{-2}e^{-2x^2}$, $y(0) = -1$

11. $2xy' - 3y = -(5x^2 + 3)y^3$, $y(1) = \dfrac{1}{\sqrt{2}}$

12. $3xy' + 5y = (4x - 5)y^4$, $y(1) = 1$

13. $2y' + 3y\cos x = e^{2x}(2 + 3\cos x)y^{-1}$, $y(0) = 1$

14. $3(xy' + y) = xy^2$, $y(1) = 3$

15. $y' - y = 2xy^2$, $y(0) = \dfrac{1}{2}$

16. $2xy' - 3y = -(20x^2 + 12)y^3$, $y(1) = \dfrac{1}{2\sqrt{2}}$

17. $y' + 2xy = 2x^3y^3$, $y(0) = \sqrt{2}$

18. $xy' + y = y^2 \ln x$, $y(1) = 1$

19. $2y' + 3y\cos x = (8 + 12\cos x)e^{2x}y^{-1}$, $y(0) = 2$

20. $4y' + x^3y = (x^3 + 8)e^{-2x}y^2$, $y(0) = 1$

21. $8xy' - 12y = -(5x^2 + 3)y^3$, $y(1) = \sqrt{2}$

22. $2(y' + y) = xy^2$, $y(0) = 2$

23. $y' + xy = (x - 1)e^x y^2$, $y(0) = 1$

24. $2y' - 3y\cos x = -e^{2x}(2 + 3\cos x)y^{-1}$, $y(0) = 1$

25. $y' - y = xy^2$, $y(0) = 1$

26. $2(xy' + y) = y^2 \ln x$, $y(1) = 2$

27. $y' + y = xy^2$, $y(0) = 1$

28. $2(y' + xy) = (x - 1)e^x y^2$, $y(0) = 2$

29. $y' + 2y\operatorname{cth}x = y^2\operatorname{ch}x$, $y(1) = \dfrac{1}{\operatorname{sh}1}$

30. $y' - y\operatorname{tg}x = -\dfrac{2}{3}y^4 \sin x$, $y(0) = 1$

31. $xy' + y = xy^2$, $y(1) = 1$

32. $y' \cdot x + y = -xy^2$, $y(1) = 1$

33. $y' + y = xy^3$, $\quad y(0) = \sqrt{2}$

34. $x^3 y' - x^2 y = y^2$, $\quad y(1) = 0,5$

35. $y' + xy = xy^3$, $\quad y(0) = 1$

36. $y' - xy = -y^3 e^{-x^2}$, $\quad y(0) = 1$

37. $y' + xy = x^3 y^3$, $\quad y(0) = 1$

38. $xy' + y = y^2 \ln x$, $\quad y(1) = 1$

39. $xy' + 2y = x^5 y^2$, $\quad y(1) = 1$

40. $y' - 2xy = 3x^3 y^2$, $\quad y(0) = 1$

41. $y' + \dfrac{2y}{x} = 3x^2 \cdot y^{4/3}$, $\quad y(1) = 27$

42. $y' - \dfrac{y}{x-1} = \dfrac{y^2}{x-1}$, $\quad y(2) = 1$

43. $y' + \dfrac{2y}{x} = \dfrac{2\sqrt{y}}{\cos^2 x}$, $\quad y(2\pi) = \dfrac{1}{4}$

44. $y' + y = e^{x/2} \cdot \sqrt{y}$, $\quad y(0) = 2,25$

45. $4xy' + 3y = -e^x x^4 \cdot y^5$, $\quad y(1) = \dfrac{1}{\sqrt[4]{e}}$

46. $y' + \dfrac{3x^2 y}{x^3 + 1} = y^2 (x^3 + 1) \cdot \sin x$, $\quad y(0) = 1$

47. $xy' + y = -x^2 y^2$, $\quad y(1) = -1$

48. $xy' + y = y^2 \ln x$, $\quad y(1) = 0,25$

49. $y' + \dfrac{y}{x} = x^2 y^4$, $\quad y(1) = 1$

50. $y' - \dfrac{2xy}{1 + x^2} = \dfrac{4\sqrt{y}}{\sqrt{1 + x^2}} \cdot \operatorname{arctg} x$, $\quad y(0) = 2$

51. $y' - 2y\,\text{tg}\,x = -y^2 \sin^2 x, \quad y(0) = 1$

52. $2y' + y = \dfrac{x^2 + 2x}{y}, \quad y(0) = 2$

53. $y' + 4xy = 2xe^{-x^2}\sqrt{y}, \quad y(0) = 1$

54. $y' - y\,\text{ctg}\,x = \dfrac{y^3}{\sin x}, \quad y\!\left(\dfrac{\pi}{2}\right) = 1$

55. $xy' + y = \dfrac{x}{2}y^3, \quad y(1) = \dfrac{1}{2}.$

56. $y'x + y = -xy^2, \quad y(e) = \dfrac{1}{e}$

57. $y' - xy = y^3 e^{-x^2}, \quad y(0) = 0{,}5$

58. $y' + xy = xy^3, \quad y(1) = 1$

59. $xy' - y = y^2 \ln x, \quad y(1) = 1$

60. $y' + 2xy = 2x^3 y^3, \quad y(0) = \sqrt{2}$

61. $y' + y = -e^{2x} y^2, \quad y(0) = 1$

62. $xy' + y = -x^2 y^2, \quad y(1) = 1$

63. $xy' + 2y = 3x^5 y^2, \quad y(1) = -1$

64. $3xy' - 2y = \dfrac{x^3}{y^2}, \quad y(5) = 3$

65. $8xy' - y = \dfrac{-1}{y^3}, \quad y(1) = 2$

66. $y' - xy = y^2 x^3, \quad y(0) = 1$

67. $y' - 2xy = y^2(x + 4x^3), \quad y(0) = 1$

68. $2\sin x \cdot y' + y\cos x = y^3 \cdot \cos x, \quad y\!\left(\dfrac{\pi}{2}\right) = \dfrac{1}{2}$

69. $y' + \dfrac{y}{x+1} = \dfrac{-1}{2}(x+1)^3 y^3, \quad y(0) = 1$

70. $y' - \dfrac{y}{x} = \dfrac{x}{y^2}, \quad y(1) = 1$

71. $y' + xy = \dfrac{x}{y}, \quad y(0) = 2$

72. $y' - 2xy = \dfrac{x}{y^2}, \quad y(0) = 1$

73. $y' - y = \dfrac{-x}{y^2}, \quad y(0) = 1$

74. $y' + y = \dfrac{x}{y}, \quad y(0) = 2$

75. $xy' + y = \dfrac{1}{y}, \quad y(1) = 0$

76. $y' - 2y = \dfrac{-12x}{y^2}, \quad y(0) = 1$

77. $y' + \dfrac{y}{x} = \dfrac{\sin x}{y}, \quad y(\pi) = \dfrac{2}{\pi}$

78. $xy' - y = \dfrac{x^2 + 1}{y}, \quad y(1) = 2$

79. $xy' - 2y = \dfrac{-4x}{3\sqrt{y}}, \quad y(1) = 1$

80. $y' + y\sin x = y^2 \cdot e^{-\cos x}, \quad y(0) = 1$

81. $y' - y\cos x = \dfrac{\sin 2x}{y}, \quad y(0) = 2$

82. $y' + y\,\mathrm{tg}\,x = 2y^2 \cdot \sin x, \quad y(0) = 0{,}5$

83. $y' + y\,\mathrm{ctg}\,x = \dfrac{3\cos x}{2y}, \quad y\left(\dfrac{\pi}{2}\right) = 2$

84. $y' + \dfrac{y}{\cos^2 x} = y^2 e^{\mathrm{tg}\,x}, \quad y(0) = 1$

85. $y' - \dfrac{y}{x} = y^2 \sin x, \quad y\left(\dfrac{\pi}{2}\right) = \dfrac{\pi}{2}$

86. $y' + \dfrac{y}{x} = \dfrac{\cos x}{yx}, \quad y(\pi) = \dfrac{1}{\pi}$

87. $y' + \dfrac{y}{x} = \dfrac{7x^4 + 3}{y}, \quad y(1) = 2$

88. $y' - \dfrac{y}{x} = \dfrac{x + 3}{y}, \quad y(1) = 3$

89. $y' + \dfrac{y}{1 + x^2} = y^2 e^{\operatorname{arctg} x}, \quad y(0) = 1$

90. $y' - y \operatorname{tg} x = \dfrac{-6 \sin x}{y}, \quad y(0) = 2$

91. $y' - \dfrac{y}{x} = -y^2 \cos x, \quad y(\pi) = \pi$

92. $y' + \dfrac{y}{x} = \dfrac{\sin x}{2yx}, \quad y(\pi) = \dfrac{1}{\sqrt{\pi}}$

93. $y' - y \sin x = -y^2 e^{\cos x}, \quad y(0) = 1$

94. $y' + \dfrac{y}{x} = \dfrac{4x + 3}{y}, \quad y(1) = 2$

95. $y' + \dfrac{y}{x} = -y^2 e^{-1/x}, \quad y(1) = e$

96. $y' + \dfrac{y}{x} = \dfrac{\cos x}{2y}, \quad y(\pi) = 0$

97. $y' - 2y = -4y^2 x, \quad y(0) = -1$

98. $y' - 2xy = -y^2 e^{x^2}, \quad y(0) = 1$

99. $y' + 2xy = 2y^2 x e^{x^2}, \quad y(0) = -1$

100. $y' - 2xy = 3xy^2, \quad y(0) = -1$

1.6. Задание 6

Найдите общий интеграл дифференциального уравнения

1. $3x^2 e^y dx + (x^3 e^y - 1)dy = 0$

2. $\left(3x^2 + \dfrac{2}{y}\cos\dfrac{2x}{y}\right)dx - \dfrac{2x}{y^2}\cos\dfrac{2x}{y}dy = 0$

3. $(3x^2 + 4y^2)dx + (8xy + e^y)dy = 0$

4. $\left(2x - 1 - \dfrac{y}{x^2}\right)dx - \left(2y - \dfrac{1}{x}\right)dy = 0$

5. $(y^2 + y\sec^2 x)dx + (2xy + \text{tg}x)dy = 0$

6. $(3x^2 y + 2y + 3)dx + (x^3 + 2x + 3y^2)dy = 0$

7. $\left(\dfrac{x}{\sqrt{x^2 + y^2}} + \dfrac{1}{x} + \dfrac{1}{y}\right)dx + \left(\dfrac{y}{\sqrt{x^2 + y^2}} + \dfrac{1}{y} - \dfrac{x}{y^2}\right)dy = 0$

8. $(\sin 2x - 2\cos(x + y))dx - 2\cos(x + y)dy = 0$

9. $\left(xy^2 + \dfrac{x}{y^2}\right)dx + \left(x^2 y - \dfrac{x^2}{y^3}\right)dy = 0$

10. $\left(\dfrac{1}{x^2} + \dfrac{3y^2}{x^4}\right)dx - \dfrac{2y}{x^3}dy = 0$

11. $\dfrac{y}{x^2}\cos\dfrac{y}{x}dx - \left(\dfrac{1}{x}\cos\dfrac{y}{x} + 2y\right)dy = 0$

12. $\left(\dfrac{x}{\sqrt{x^2 + y^2}} + y\right)dx + \left(x + \dfrac{y}{\sqrt{x^2 + y^2}}\right)dy = 0$

13. $\dfrac{1 + xy}{x^2 y}dx + \dfrac{1 - xy}{xy^2}dy = 0$

14. $\dfrac{dx}{y} - \dfrac{x + y^2}{y^2}dy = 0$

15. $\dfrac{y}{x^2}dx - \dfrac{xy+1}{x}dy = 0$

16. $\left(xe^x + \dfrac{y}{x^2}\right)dx - \dfrac{1}{x}dy = 0$

17. $\left(10xy - \dfrac{1}{\sin y}\right)dx + \left(5x^2 + \dfrac{x\cos y}{\sin^2 y} - y^2 \sin y^3\right)dy = 0$

18. $\left(\dfrac{y}{x^2 + y^2} + e^x\right)dx - \dfrac{xdy}{x^2 y^2} = 0$

19. $e^y dx + (\cos y + xe^y)dy = 0$

20. $(y^3 + \cos x)dx + (3xy^2 + e^y)dy = 0$

21. $xe^{y^2}dx + (x^2 ye^{y^2} + tg^2 y)dy = 0$

22. $(5xy^2 - x^2)dx + (5x^2 y - y)dy = 0$

23. $(\cos(x + y^2) + \sin x)dx + 2y\cos(x + y^2)dy = 0$

24. $(x^2 - 4xy - 2y^2)dx + (y^2 - 4xy - 2x^2)dy = 0$

25. $\left(\sin y + y\sin x + \dfrac{1}{x}\right)dx + \left(x\cos y - \cos x + \dfrac{1}{y}\right)dy = 0$

26. $\left(1 + \dfrac{1}{y}e^{x/y}\right)dx + \left(1 - \dfrac{1}{y^2}e^{x/y}\right)dy = 0$

27. $\dfrac{(x-y)dx + (x+y)dy}{x^2 + y^2} = 0$

28. $2(3xy^2 + 2x^3)dx + 3(2x^2 y + y^2)dy = 0$

29. $(3x^3 + 6x^2 y + 3xy^2)dx + (2x^3 + 3x^2 y)dy = 0$

30. $xy^2 dx + y(x^2 + y^2)dy = 0$

31. $xdx + ydy + \dfrac{(xdy - ydx)}{x^2 + y^2} = 0$

32. $(3x^2 + 6xy^2)dx + (6x^2 y + 4y^3)dy = 0$

33. $3x^2e^y dx + (x^3 e^y - 1)dy = 0$

34. $e^{-y} dx + (1 - xe^{-y})dy = 0$

35. $2x \cos^2 y dx + (2y - x^2 \sin 2y)dy = 0$

36. $(3x^2 + 2y)dx + (2x - 3)dy = 0$

37. $(3x^2 y - 4xy^3)dx + (x^3 - 4x^2 y + 12y^3)dy = 0$

38. $(x \cos 2y + 1)dx - x^2 \sin 2y dy = 0$

39. $(3x^2 y - 2x^3 + y^3)dx + (3xy^2 + x^3 - 2y^3)dy = 0$

40. $\left(\dfrac{xy}{\sqrt{1+x^2}} + 2xy - \dfrac{y}{x} \right)dx + (\sqrt{1+x^2} + x^2 - \ln x)dy = 0$

41. $\dfrac{2x(1-e^y)}{(1+x^2)^2}dx + \dfrac{e^y}{1+x^2}dy = 0$

42. $(x + y + 1)dx + (x - y^2 + 3)dy = 0$

43. $(e^x + y + \sin y)dx + (e^y + x + x \cos y)dy = 0$

44. $(x + y - 1)dx + (e^y + x)dy = 0$

45. $(x + \sin y)dx + (x \cos y + \sin y)dy = 0$

46. $(y + e^x \sin y)dx + (x + e^x \cos y)dy = 0$

47. $(xy + \sin y)dx + (0,5x^2 + x \cos y)dy = 0$

48. $(x^2 + y^2 + y)dx + (2xy + x + e^y)dy = 0$

49. $(2xye^{x^2} + \ln y)dx + \left(e^{x^2} + \dfrac{x}{y} \right)dy = 0$

50. $(\sin y + (1 - y)\cos x)dx + ((1 + x)\cos y - \sin x)dy = 0$

51. $(y + x \ln y)dx + \left(\dfrac{x^2}{2y} + x + 1 \right)dy = 0$

52. $(x^2 + \sin y)dx + (1 + x + \cos y)dy = 0$

53. $ye^x dx + (y + e^x)dy = 0$

54. $(e^x \sin y + x)dx + (e^x \cos y + y)dy = 0.$

55. $(\ln y - 5y^2 \sin 5x)dx + \left(\dfrac{x}{y} + 2y\cos 5x\right)dy = 0$

56. $(3x^2 y + \sin x)dx + (x^3 - \cos y)dy = 0$

57. $(e^{x+y} + 3x^2)dx + (e^{x+y} + 4y^3)dy = 0$

58. $\left(tgy - \dfrac{y}{\sin^2 y}\right)dx + \left(ctgx + \dfrac{x}{\cos^2 y}\right)dy = 0$

59. $\left(\dfrac{y}{x^2 + y^2} - y\right)dx + \left(e^y - x - \dfrac{x}{x^2 + y^2}\right)dy = 0$

60. $\dfrac{y}{x}dx + (y^3 + \ln x)dy = 0$

61. $(2x + y)dx + (x + 2y)dy = 0$

62. $(10xy - 8y + 1)dx + (5x^2 - 8x + 3)dy = 0$

63. $2x\cos^2 ydx + (2y - x^2 \sin 2x)dy = 0$

64. $(\sin xy + xy\cos xy)dx + x^2 \cos xydy = 0$

65. $(x^3 + xy^2)dx + (x^2 y + y^3)dy = 0$

66. $(x + y^2)dx + 2xydy = 0$

67. $(2x^3 + xy^2)dx + (yx^2 + 2y^3)dy = 0$

68. $(6xy^2 + 4x^3)dx + (3y^2 + 6yx^2)dy = 0$

69. $\left(3x^2 tgy - \dfrac{2y^3}{x^3}\right)dx + \left(\dfrac{x^3}{\cos^2 y} + 4y^3 + \dfrac{3y^2}{x^2}\right)dy = 0$

70. $\left(\dfrac{\sin 2x}{y} + x\right)dx + \left(y - \dfrac{\sin^2 x}{y^2}\right)dy = 0$

71. $(3x^2 - 2x - y)dx + (2y - x + 3y^2)dy = 0$

72. $\left(\sin y + y\sin x + \dfrac{1}{x}\right)dx + \left(x\cos y - \cos x + \dfrac{1}{y}\right)dy = 0$

73. $\dfrac{2xdx}{y^3} + \dfrac{(y^2 - 3x^2)dy}{y^4} = 0$

74. $(5x^4y^2 + e^x)dx + (2x^5y - \sin y)dy = 0$

75. $(3x^2y^4 - 1)dx + \left(4x^3y^3 - \dfrac{1}{y}\right)dy = 0$

76. $(4x^3 - y^2)dx + \left(\dfrac{1}{\sqrt{1-y^2}} - 2xy\right)dy = 0$

77. $\left(\dfrac{2x}{y} + 3\cos 3x\right)dx + \left(2 - \dfrac{x^2}{y^2}\right)dy = 0$

78. $\left(2xy^6 - \dfrac{y}{x^2}\right)dx + \left(6x^2y^5 + \dfrac{1}{x} - \dfrac{1}{y^2}\right)dy = 0$

79. $(3x^2e^{2y} - y\sin x)dx + (2x^3e^{2y} + \cos x)dy = 0$

80. $\left(y - \dfrac{1}{1+x^2}\right)dx + (x + 2e^{2x})dy = 0$

81. $\left(3e^{3x}\,\mathrm{tg}\,y - \dfrac{1}{x^4}\right)dx + \left(\dfrac{e^{3x}}{\cos^2 y} - 3y^2\right)dy = 0$

82. $\left(2x + \dfrac{1}{x+y} + \dfrac{1}{y}\right)dx + \left(\dfrac{1}{x+y} - \dfrac{x}{y^2}\right)dy = 0$

83. $\left(3x^2 - \dfrac{y\cos x}{\sin^2 x}\right)dx + \left(\dfrac{1}{\sin x} - \dfrac{1}{y}\right)dy = 0$

84. $(y^3e^x - 1)dx + 3y^2e^x dy = 0$

85. $\dfrac{2y}{x^2}\cos\dfrac{2y}{x}dx - \left(3y^2 + \dfrac{2}{x}\cos\dfrac{2y}{x}\right)dy = 0$

86. $(8xy + e^x)dx + (3y^2 + 4x^2)dy = 0$

87. $\left(2x - \dfrac{1}{y}\right)dx - \left(2y - 1 - \dfrac{x}{y^2}\right)dy = 0$

88. $(2xy + tgy)dx + \left(x^2 + \dfrac{x}{\cos^2 y}\right)dy = 0$

89. $(y^3 + 2y + 3x^2)dx + (3y^2 x + 2x + 3)dy = 0$

90. $\left(\dfrac{x}{\sqrt{x^2 + y^2}} + \dfrac{1}{x} + \dfrac{y}{x^2}\right)dx + \left(\dfrac{y}{\sqrt{x^2 + y^2}} + \dfrac{1}{y} - \dfrac{1}{x}\right)dy = 0$

91. $2\cos(x + y)dx + (2\cos(x + y) - \sin 2y)dy = 0$

92. $\left(xy^2 - \dfrac{y^2}{x^3}\right)dx + \left(yx^2 + \dfrac{y}{x^2}\right)dy = 0$

93. $\dfrac{2x}{y^3}dx - \left(\dfrac{1}{y^2} + \dfrac{3x^2}{y^4}\right)dy = 0$

94. $\left(\dfrac{1}{y}\cos\dfrac{x}{y} + 2x\right)dx - \dfrac{x}{y^2}\cos\dfrac{x}{y}dy = 0$

95. $\left(y + \dfrac{x}{\sqrt{x^2 + y^2}}\right)dx + \left(x + \dfrac{y}{\sqrt{x^2 + y^2}}\right)dy = 0$

96. $\dfrac{1 - xy}{yx^2}dx + \dfrac{1 + xy}{y^2 x}dy = 0$

97. $\dfrac{y + x^2}{x^2}dx - \dfrac{dy}{x} = 0$

98. $\dfrac{ydx}{x^2 + y^2} - \left(\dfrac{x}{x^2 + y^2} + e^y\right)dy = 0$

99. $(\cos x + ye^x)dx + e^x dy = 0$

100. $(3yx^2 + e^x)dx + (x^3 + \cos y)dy = 0$

1.7. Задание 7

Найдите общий интеграл дифференциального уравнения

1	$y'''x \ln x = y''$	2	$xy''' + y'' = 1$
3	$2xy''' = y''$	4	$xy''' + y'' = x + 1$
5	$\text{tg}x \cdot y'' - y' + \dfrac{1}{\sin x} = 0$	6	$x^2 y'' + xy' = 1$
7	$y'''\text{ctg}2x + 2y'' = 0$	8	$x^3 y''' + x^2 y'' = 1$
9	$\text{tg}x \cdot y''' = 2y''$	10	$y'''\text{cth}2x = 2y''$
11	$x^4 y'' + x^3 y' = 1$	12	$xy''' + 2y'' = 0$
13	$(1 + x^2)y'' + 2xy' = x^3$	14	$x^5 y''' + x^4 y'' = 1$
15	$xy''' - y'' + \dfrac{1}{x} = 0$	16	$xy''' + y'' + x = 0$
17	$\text{th}x \cdot y^{(4)} = y'''$	18	$xy''' + y'' = \sqrt{x}$
19	$y'''\text{tg}x = y'' + 1$	20	$y'''\text{tg}5x = 5y''$
21	$y'''\text{th}7x = 7y''$	22	$x^3 y''' + x^2 y'' = \sqrt{x}$
23	$\text{cth}x \cdot y'' - y' + \dfrac{1}{\text{ch}x} = 0$	24	$(x + 1)y''' + y'' = (x + 1)$
25	$(1 + \sin x)y''' = \cos x \cdot y''$	26	$xy''' + y'' = \dfrac{1}{\sqrt{x}}$
27	$-xy''' + 2y'' = \dfrac{2}{x^2}$	28	$\text{cth}xy'' + y' = \text{ch}x$
29	$x^4 y'' + x^3 y' = 4$	30	$y'' + \dfrac{2x}{x^2 + 1}y' = 2x$
31	$(1 + x^2)y'' + 2xy' = 12x^3$	32	$xy'' - y' - x^2 = 0$
33	$y'' - y'\text{ctg}x = \sin x$	34	$y'' = \dfrac{x}{\sqrt{(1 - x^2)^3}}$
35	$xy'' - 2y' = 2x^4$	36	$xy'' = 1 + \ln x$

37	$xy'' - y'\mathrm{tg}x = \cos x$	38	$y'' = \dfrac{x}{\sqrt{(1-4x^2)^3}}$
39	$xy'' - y' = 4x^3$	40	$xy'' - y' = x^2\cos x$
41	$x^3 y'' = 4\ln x$	42	$y''' = x\sin^2 x$
43	$y'' = xe^{-x}$	44	$y''' = \cos^2 x$
45	$y'''\sin^4 x = \sin 2x$	46	$xy'' = y'\ln\left(\dfrac{y'}{x}\right)$
47	$y'' - \dfrac{y'}{x-1} = x(x-1)$	48	$(1-x^2)y'' - xy' = 2$
49	$2xy'' = y'$	50	$y'' = (y')^2$
51	$xy''' = 2$	52	$y'' = \dfrac{1}{1+x^2}$
53	$y'' + 2x(y')^2 = 0$	54	$xy'' - y' - x\sin\dfrac{y'}{x} = 0$
55	$x^3 y'' + x^2 y' - 1 = 0$	56	$(1+e^x)y'' + y' = 0$
57	$y''' = 2(y'' - 1)\mathrm{ctg}x$	58	$x^2 y''' = (y'')^2$
59	$y''' = (y'')^2$	60	$xy''' + y'' - x - 1 = 0$
61	$(1+x^2)y'' + 2xy' = x^3$	62	$y'' = \sin x + \cos x$
63	$y''' = \dfrac{\ln x}{x^2}$	64	$xy''' = y''$
65	$y'' = xe^x$	66	$y'' = x\ln x$
67	$y''' = \sin^2 x$	68	$y''' = x + \cos x$
69	$x^2 y''' + xy'' = 1$	70	$xy''' + y'' = 1$
71	$xy''' + y'' = 3x - 2$	72	$xy''' + 4y'' = 0$
73	$y'''\mathrm{ctg}4x = -4y''$	74	$(x-1)y''' + y'' = x - 1$
75	$(1+\cos x)y''' = -\sin xy''$	76	$(1-x^2)y'' - 2xy' = x^3$

77	$-xy'' + 2y' = \dfrac{2}{x}$	78	$x^3 y'' + x^2 y' = 5$
79	$y'' + \dfrac{2x}{x^2+4} y' = x$	80	$xy'' - y' = x$
81	$y'' + y'\mathrm{tg}x = -\cos^2 x$	82	$y'' = \dfrac{6x}{\sqrt{(4+x^2)^3}}$
83	$xy'' - 2y' = 3x^3$	84	$xy'' - y' = x^2 \sin x$
85	$xy'' + y' = 1 + \ln x$	86	$xy'' - y' = \ln x$
87	$(1 + \sin x)y''' = y'' \cos x$	88	$(3 + e^x)y''' = e^x y''$
89	$xy'' - 2y' = x + 2$	90	$xy'' + 3y' = x^2 + 1$
91	$y'' + y'\mathrm{tg}x = \sin 2x$	92	$y'' + y'\mathrm{tg}x = \cos x$
93	$y'' - y'\mathrm{tg}x = \sin x$	94	$y'' - y'\mathrm{tg}x = \cos x$
95	$y'' + y'\mathrm{ctg}x = \sin x$	96	$y'' - y'\mathrm{ctg}x = \sin x$
97	$y'' + y'\mathrm{ctg}x = \cos x$	98	$y'' + y'\mathrm{tg}x = \dfrac{1}{\cos x}$
99	$y'' + y'\mathrm{ctg}x = \dfrac{1}{\sin x}$	100	$y'' - y'\mathrm{tg}x = \dfrac{1}{\cos x}$

1.8. Задание 8

Найти решение задачи Коши

1.	$4y^3 y'' = y^4 - 1, \quad y(0) = \sqrt{2}, \quad y'(0) = \dfrac{1}{2\sqrt{2}}$
2.	$y'' = 128y^3, \quad y(0) = 1, \ y'(0) = 8$

3.	$y''y^3 + 64 = 0, \quad y(0) = 4, \; y'(0) = 2$
4.	$y'' + 2\sin y \cos^3 y = 0, \quad y(0) = 0, \; y'(0) = 1$
5.	$y'' = 32\sin^3 y \cos y, \quad y(1) = \pi/2, \; y'(1) = 4$
6.	$y'' = 98y^3, \quad y(1) = 1, \; y'(1) = 7$
7.	$y''y^3 + 49 = 0, \quad y(3) = -7, \; y'(3) = -1$
8.	$4y^3 y'' = 16y^4 - 1, \quad y(0) = \dfrac{\sqrt{2}}{2}, \; y'(0) = \dfrac{1}{\sqrt{2}}$
9.	$y'' + 8\sin y \cos^3 y = 0, \quad y(0) = 0, \; y'(0) = 2$
10.	$y'' = 72y^3, \quad y(2) = 1, \; y'(2) = 6$
11.	$y''y^3 + 36 = 0, \quad y(0) = 3, \; y'(0) = 2$
12.	$y'' = 18\sin^3 y \cos y, \quad y(1) = \pi/2, \; y'(1) = 3$
13.	$4y^3 y'' = y^4 - 16, \quad y(0) = 2\sqrt{2}, \; y'(0) = \dfrac{1}{\sqrt{2}}$
14.	$y'' = 50y^3, \quad y(3) = 1, \; y'(3) = 5$
15.	$y''y^3 + 25 = 0, \quad y(2) = -5, \; y'(2) = -1$
16.	$y'' + 18\sin y \cos^3 y = 0, \quad y(0) = 0, \; y'(0) = 3$
17.	$y'' = 8\sin^3 y \cos y, \quad y(1) = \pi/2, \; y'(1) = 2$
18.	$y'' = 32y^3, \quad y(4) = 1, \; y'(4) = 4$
19.	$y''y^3 + 16 = 0, \quad y(1) = 2, \; y'(1) = 2$
20.	$y'' + 32\sin y \cos^3 y = 0, \quad y(0) = 0, \; y'(0) = 4$
21.	$y'' = 50\sin^3 y \cos t, \quad y(1) = \pi/2, \; y'(1) = 5$
22.	$y'' = 18y^3, \quad y(1) = 1, \; y'(1) = 3$
23.	$y''y^3 + 9 = 0, \quad y(1) = 1, \; y'(1) = 3$
24.	$y^3 y'' = 4(y^4 - 1), \quad y(0) = \sqrt{2}, \; y'(0) = \sqrt{2}$

25.	$y'' + 50\sin y\cos^3 y = 0, \quad y(0) = 0, \ y'(0) = 5$
26.	$y'' = 8y^3, \quad y(0) = 1, \ y'(0) = 2$
27.	$y''y^3 + 4 = 0, \quad y(0) = -1, \ y'(0) = -2$
28.	$y'' = 2\sin^3 y\cos y, \quad y(1) = \pi/2, \ y'(1) = 1$
29.	$y^3 y'' = y^4 - 16, \quad y(0) = 2\sqrt{2}, \ y'(0) = \sqrt{2}$
30.	$y'' = 2y^3, \quad y(-1) = 1, \ y'(-1) = 1$
31.	$y''y^3 + 1 = 0, \quad y(1) = -1, \ y'(1) = -1$
32.	$y'' - e^y y' = 0, \quad y(0) = 0, \ y'(0) = 1$
33.	$y'y'' = 2y, \quad y(0) = 0, \ y'(0) = 0$
34.	$yy'' = (y')^2, \quad y(0) = 1, \ y'(0) = 3$
35.	$y''y^3 = 3, \quad y(1) = 1, \ y'(1) = 1$
36.	$y'' - 12y^2 = 0, \quad y(0) = 0{,}5, \ y'(0) = 1$
37.	$2y'' = e^{4y}, \quad y(0) = 0, \ y'(0) = 0{,}5$
38.	$(y - 2)y'' = 2(y')^2, \quad y(0) = 3, \ y'(0) = 1$
39.	$2yy'' = 3 + (y')^2, \quad y(1) = 1, \ y'(1) = 1$
40.	$y'' = 3\sqrt{y + 1}, \quad y(2) = 0, \ y'(2) = 2$
41.	$(y + 1)^2 y'' = (y')^3, \quad y(0) = 0, \ y'(0) = 1$
42.	$y'y'' = 18y, \quad y(1) = 1, \ y'(1) = 3$
43.	$y''y^3 = 1, \quad y(0) = 0{,}5, \ y'(0) = 0$
44.	$3y'y'' = 2y, \quad y(0) = 1, \ y'(0) = 1$
45.	$y'' = e^y, \quad y(0) = 0, \ y'(0) = \sqrt{2}$
46.	$y^3 y'' = -1, \quad y(1) = 1, \ y'(1) = 0$

47.	$16y''\sqrt{y} = 1$, $\quad y\left(\dfrac{8}{3}\right) = 1$, $\quad y'\left(\dfrac{8}{3}\right) = \dfrac{1}{2}$
48.	$3y'' + y - \dfrac{5}{3} = 0$, $\quad y\left(\dfrac{3}{4}\right) = 1$, $\quad y'\left(\dfrac{3}{4}\right) = 1$
49.	$1 + (y')^2 = 2yy''$, $\quad y(0) = 1$, $\quad y'(0) = 0$
50.	$y'' = 2yy'$, $\quad y(0) = 1$, $\quad y'(0) = 1$
51.	$yy'' = (y')^2$, $\quad y(0) = 1$, $\quad y'(0) = 1$
52.	$y'' = e^{2y}$, $\quad y(0) = 0$, $\quad y'(0) = 1$
53.	$2yy'' = 3(y')^2$, $\quad y(0) = 1$, $\quad y'(0) = 1$
54.	$2y^2 y'' = -1$, $\quad y\left(\dfrac{2}{3}\right) = 1$, $\quad y'\left(\dfrac{2}{3}\right) = 1$
55.	$yy'' = 3(y')^2$, $\quad y(0) = 1$, $\quad y'(0) = 1$
56.	$y'' \cdot \sqrt{y} = 1$, $\quad y\left(\dfrac{2}{3}\right) = 1$, $\quad y'\left(\dfrac{2}{3}\right) = 2$
57.	$2yy'' = 5 + (y')^2$, $\quad y(2) = 6$, $\quad y'(2) = 2$
58.	$y'' + 2e^{2y} \cdot y' = 0$, $\quad y(0,5) = 0$, $\quad y'(0,5) = -1$
59.	$(y+1)y'' = (y')^2$, $\quad y(0) = 0$, $\quad y'(0) = 1$
60.	$y'' = 2(1 + \ln y)y'$, $\quad y(0) = e$, $\quad y'(0) = 2e$
61.	$y'' \cdot \operatorname{tg} 2y = 2(y')^2$, $\quad y(0) = \pi/4$, $\quad y'(0) = 1$
62.	$y'' \cdot \operatorname{tg} y = 2(y')^2$, $\quad y(1) = 3\pi/4$, $\quad y'(1) = 1/2$
63.	$(y-1)y'' = 2(y')^2$, $\quad y(1) = 2$, $\quad y'(1) = 1$
64.	$1 + (y')^2 = yy''$, $\quad y(0) = 1$, $\quad y'(0) = 0$
65.	$y''(2y + 3) = 2(y')^2$, $\quad y(0) = 0$, $\quad y'(0) = 1,5$
66.	$yy'' = (y')^2$, $\quad y(0) = 1$, $\quad y'(0) = 2$

67.	$4y'' = 3\sqrt{y+4}, \quad y(4) = 0, \; y'(4) = 2\sqrt{2}$
68.	$y''(1+y) = (y')^2 + y', \quad y(0) = 1, \; y'(0) = 1$
69.	$y''\sqrt{y} = y', \quad y(1) = 1, \; y'(1) = 2$
70.	$y'' = e^y \cdot y', \quad y(1) = 0, \; y'(1) = 1$
71.	$y''\operatorname{ctg}y + 2(y')^2 = 0, \quad y(0) = \pi/4, \; y'(0) = 0{,}5$
72.	$y''(2y-1) = (y')^2, \quad y(1) = 1, \; y'(1) = 1$
73.	$yy'' = -(y')^2, \quad y(1) = 2, \; y'(1) = -0{,}5$
74.	$4y'' = e^{2y}, \quad y(0) = 0, \; y'(0) = 0{,}5$
75.	$y'' = 12\sqrt{y-1}, \quad y(1) = 2, \; y'(1) = 4$
76.	$y'' + 4e^y y' = 0, \quad y(0{,}25) = 0, \; y'(0{,}25) = -4$
77.	$3y'y'' = 2y \quad y(3) = 1, \; y'(3) = 1$
78.	$y'' = \dfrac{2}{3}\sqrt[3]{y}, \quad y(3) = 1, \; y'(3) = 1$
79.	$y'' + 2e^{-y} = 0, \quad y(0) = 0, \; y'(0) = 2$
80.	$2yy'' = 4 + (y')^2, \quad y(0) = 4, \; y'(0) = 0$
81.	$y''y^2 = -8, \quad y\left(\dfrac{1}{6}\right) = 1, \; y'\left(\dfrac{1}{6}\right) = 4$
82.	$y'' = 6y^2 y', \quad y(0) = 1, \; y'(0) = 2$
83.	$y'' = 2\cos y \sin^3 y, \quad y(0) = \pi/2, \; y'(0) = 1$
84.	$y''y^3 = -2y', \quad y(1) = 1, \; y'(1) = 1$
85.	$y'' = (1 + \ln y)y', \quad y(0) = e, \; y'(0) = e$
86.	$y'' = e^{-y} \cdot y', \quad y(0) = 1, \; y'(0) = -\dfrac{1}{e}$
87.	$y''y' = 18y, \quad y(1) = 1, \; y'(1) = 3$

88.	$y''y' = -e^{3y}, \quad y(1) = 0, \ y'(1) = -1$
89.	$y''ctg2y + 2(y')^2 = 0, \quad y(0) = -\pi/4, \ y'(0) = 1$
90.	$2y''y^2 = (y')^3, \quad y(0) = 1, \ y'(0) = 2$
91.	$4y'' - 3y^5 = 0, \quad y(1) = 1, \ y'(1) = -0,5$
92.	$y'' + 2e^{-2y} \cdot y' = 0, \quad y(0,5) = 0, \ y'(0,5) = 1$
93.	$64y'y''y^2 = -9, \quad y(1) = 1, \ y'(1) = 0,75$
94.	$y'y''y^4 = -8, \quad y(1) = 2, \ y'(1) = 1$
95.	$y'' + 2y' \cdot y = 0, \quad y(1) = 1, \ y'(1) = -1$
96.	$125y'' \cdot y' \cdot \sqrt{y} = 36, \quad y(1) = 1, \ y'(1) = 1,2$
97.	$y'' \cdot \sqrt{y} = y', \quad y(1) = 1, \ y'(1) = 2$
98.	$y'' + 3y' \cdot \sqrt{y} = 0, \quad y(1) = 1, \ y'(1) = -2$
99.	$y' \cdot y'' = 4\sqrt{y}, \quad y(1) = 1, \ y'(1) = 2$
100.	$2y'' = e^{4y}, \quad y(-1) = 0, \ y'(-1) = 0,5$

1.9. Задание 9

Найдите общее решение дифференциального уравнения

1.	$y''' + 3y'' + 2y' = 8 + 4x$	2.	$y''' + 5y'' + 4y' = 8x + 14$
3.	$y''' - 3y'' + 2y' = 4x - 4$	4.	$y''' + 5y'' + 6y' = 12x + 16$
5.	$y''' - 5y'' - 6y' = -12x - 16$	6.	$y''' + 7y'' + 6y' = 12x + 20$
7.	$y''' - 7y'' + 6y' = 12x - 8$	8.	$y''' - 5y'' + 4y' = 8x - 6$
9.	$y''' + y'' - 2y' = -4x$	10.	$y''' - y'' - 2y' = -4x - 4$
11.	$y''' - 5y'' + 6y' = 12x - 4$	12.	$y''' + 3y'' + 2y' = 4x + 10$
13.	$y''' + 5y'' + 4y' = 8x + 18$	14.	$y''' - 3y'' + 2y' = 4x - 2$

15.	$y''' - 5y'' - 6y' = -12x - 22$	16.	$y''' + 5y'' + 6y' = 12x + 22$
17.	$y''' - 9y' = -27x^2 + 18x - 3$	18.	$y''' - 7y'' + 6y' = 12x - 2$
19.	$y''' - 8y'' + 16y' = 32x - 48$	20.	$y''' + y'' - 2y' = -4x - 2$
21.	$y''' + 10y'' + 25y' = 50x - 30$	22.	$y''' - 5y'' + 6y' = 12x + 2$
23.	$y''' + 3y'' + 2y' = 6x^2 + 18x + 2$	24.	$y''' + 2y'' + y' = 2x + 2$
25.	$y''' + 5y'' + 4y' = 12x^2 + 30x - 2$	26.	$y''' - 2y'' + y' = 2x - 6$
27.	$y''' - 3y'' + 2y' = 6x^2 - 18x + 2$	28.	$y''' + 4y'' + 4y' = 8x$
29.	$y''' + 5y'' + 6y' = 18x^2 + 30x - 6$	30.	$y''' - 4y'' + 4y' = 8x - 16$
31.	$y''' - 5y'' - 6y' = -18x^2 - 30x + 18$	32.	$y''' + 6y'' + 9y' = 18x - 6$
33.	$y''' + 7y'' + 6y' = 18x^2 + 42x - 6$	34.	$y''' - 6y'' + 9y' = 18x - 30$
35.	$y''' - 7y'' + 6y' = 18x^2 - 42x - 6$	36.	$y''' + 8y'' + 16y' = 32x - 16$
37.	$y''' - 5y'' + 4y' = 12x^2 - 30x - 2$	38.	$y''' - 5y'' + 4y' = 8x - 2$
39.	$y''' + y'' - 2y' = -6x^2 + 6x + 10$	40.	$y''' - y'' - 2y' = -4x - 6$
41.	$y''' - y'' - 2y' = -6x^2 - 6x + 10$	42.	$y''' - 81y' = -162x - 81$
43.	$y''' - 5y'' + 6y' = 18x^2 - 30x - 6$	44.	$y''' - y' = -3x^2 + 2x + 5$
45.	$y''' + 2y'' + y' = 3x^2 + 14x + 11$	46.	$y''' - 4y' = -12x^2 + 8x + 2$
47.	$y''' + 4y'' + 4y' = 12x^2 + 32x + 18$	48.	$y''' + 7y'' + 6y' = 12x + 26$
49.	$y''' - 4y'' + 4y' = 12x^2 - 16x + 2$	50.	$y''' - y' = -2x - 1$
51.	$y''' + 6y'' + 9y' = 27x^2 + 54x + 27$	52.	$y''' - 4y' = -8x - 4$
53.	$y''' - 6y'' + 9y' = 27x^2 - 18x + 3$	54.	$y''' - 9y' = -18x - 9$
55.	$y''' + 8y'' + 16y' = 48x^2 + 80x + 38$	56.	$y''' - 16y' = -32x - 16$
57.	$y''' - 8y'' + 16y' = 48x^2 - 16x + 6$	58.	$y''' - 25y' = -50x - 25$
59.	$y''' + 10y'' + 25y' = 75x^2 + 110x + 51$	60.	$y''' - 36y' = -72x - 36$
61.	$y''' - 10y'' + 25y' = 75x^2 - 10x + 11$	62.	$y''' - 49y' = -98x - 49$
63.	$y''' + 4y'' + 4y' = 12x^2 + 24x + 14$	64.	$y''' - 64y' = -128x - 64$

65.	$y''' - 4y'' + 4y' = 12x^2 - 24x + 14$	66.	$y''' - 100y' = -200x - 100$
67.	$y''' + 6y'' + 9y' = 27x^2 + 36x + 24$	68.	$y''' + y'' = 3x^2 + 6x + 6$
69.	$y''' - 6y'' + 9y' = 12x^2 - 36x + 24$	70.	$y''' - y'' = -3x^2 - 6x + 6$
71.	$y''' + 8y'' + 16y' = 48x^2 + 48x + 38$	72.	$y''' + 2y'' = 6x^2 + 12x + 6$
73.	$y''' - 8y'' + 16y' = 48x^2 - 48x + 38$	74.	$y''' - 2y'' = -6x^2 - 12x + 6$
75.	$y''' + 10y'' + 25y' = 75x^2 + 60x + 56$	76.	$y''' + 3y'' = 9x^2 + 18x + 6$
77.	$y''' - 10y'' + 25y' = 75x^2 - 60x + 56$	78.	$y''' - 3y'' = -9x^2 - 18x + 6$
79.	$y''' - 16y' = -48x^2 + 32x - 10$	80.	$y''' + 4y'' = 12x^2 + 24x + 6$
81.	$y''' - 25y' = -75x^2 + 50x - 19$	82.	$y''' - 4y'' = -12x^2 - 24x + 6$
83.	$y''' - 36y' = -108x^2 + 72x - 30$	84.	$y''' + 5y'' = 15x^2 + 30x + 6$
85.	$y''' - 49y' = -147x^2 + 98x - 43$	86.	$y''' - 5y'' = -15x^2 - 30x + 6$
87.	$y''' - 64y' = -192x^2 + 128x - 58$	88.	$y''' + 6y'' = 18x^2 + 36x + 6$
89.	$y''' - 81y' = -243x^2 + 162x - 75$	90.	$y''' - 6y'' = -18x^2 - 36x + 6$
91.	$y''' - 100y' = -300x^2 + 200x - 94$	92.	$y''' + 7y'' = 21x^2 + 42x + 6$
93.	$y''' - 2y'' + y' = 3x^2 - 10x + 3$	94.	$y''' - 7y'' = -21x^2 - 42x + 6$
95.	$y''' + 2y'' + y' = 3x^2 + 12x + 8$	96.	$y''' + 8y'' = 24x^2 + 48x + 6$
97.	$y''' - 2y'' + y' = 3x^2 - 12x + 8$	98.	$y''' - 8y'' = -24x^2 - 48x + 6$
99.	$y''' - 10y'' + 25y' = 50x - 70$	100	$y''' + 9y'' = 27x^2 + 54x + 6$

1.10. Задание 10

Найдите общее решение дифференциального уравнения

1	$y'' + 2y' + y = 2e^{-x}$	2	$y'' + 3y' - 4y = (10x + 7)e^{x}$
3	$y'' - 3y' - 4y = (-10x - 3)e^{-x}$	4	$y'' - 2y' + y = 2e^{x}$
5	$y'' + 4y' + 4y = 4e^{-2x}$	6	$y'' + 5y' + 4y = (6x - 1)e^{-x}$
7	$y'' - 4y' + 4y = 4e^{2x}$	8	$y'' - 5y' + 4y = (-6x - 1)e^{x}$
9	$y'' + 6y' + 9y = 4e^{-3x}$	10	$y'' + 5y' + 6y = (2x + 1)e^{-2x}$
11	$y'' - 6y' + 9y = 4e^{3x}$	12	$y'' - 5y' + 6y = (3 - 2x)e^{2x}$
13	$y'' + 8y' + 16y = 2e^{-4x}$	14	$y'' + 5y' - 6y = (14x - 5)e^{x}$
15	$y'' - 8y' + 16y = 2e^{4x}$	16	$y'' - 5y' - 6y = (9 - 14x)e^{-x}$
17	$y'' + 10y' + 25y = 2e^{-5x}$	18	$y'' + 2y' + y = 4x \cdot e^{x}$
19	$y'' - 10y' + 25y = 2e^{5x}$	20	$y'' - 2y' + y = (x + 1)e^{2x}$
21	$y'' + y' - 2y = (6x + 5)e^{x}$	22	$y'' + 4y' + 4y = (16x - 8)e^{2x}$
23	$y'' - y' - 2y = (-6x - 1)e^{-x}$	24	$y'' - 4y' + 4y = (x + 1)e^{-x}$
25	$y'' + 6y' + 9y = 4x \cdot e^{-x}$	26	$y'' - 6y' + 9y = (16x - 24)e^{-x}$
27	$y'' + 8y' + 16y = (36x - 60)e^{2x}$	28	$y'' - 8y' + 16y = (4x - 12)e^{2x}$
29	$y'' + 10y' + 25y = (49x + 63)e^{2x}$	30	$y'' + y' - 2y = (6x + 5)e^{x}$
31	$y'' + y' - 2y = (10x + 17)e^{3x}$	32	$y'' - y' - 2y = (4x + 9)e^{3x}$
33	$y'' + 3y' - 4y = (6x + 13)e^{2x}$	34	$y'' - 3y' - 4y = (-6x - 5)e^{2x}$
35	$y'' + 5y' + 4y = (18x - 9)e^{2x}$	36	$y'' - 5y' + 4y = (-2x - 3)e^{2x}$
37	$y'' - 5y' + 6y = (20x - 29)e^{-2x}$	38	$y'' + 5y' + 6y = (2x + 1)e^{-x}$
39	$y'' + 5y' - 6y = (-10x + 13)e^{-x}$	40	$y'' - 5y' - 6y = (8x - 17)e^{-2x}$
41	$y'' + y' = (12x + 16)e^{2x}$	42	$y'' - y' = (4x - 2)e^{-x}$
43	$y'' + 2y' = (16x + 20)e^{2x}$	44	$y'' - 2y' = (6x - 2)e^{-x}$
45	$y'' + 3y' = (20x + 24)e^{2x}$	46	$y'' - 3y' = (8x - 14)e^{-x}$

47	$y'' + 4y' = (24x + 4)e^{2x}$	48	$y'' - 4y' = (24x - 28)e^{-2x}$
49	$y'' + 5y' = (28x + 4)e^{2x}$	50	$y'' - 5y' = (28x - 46)e^{-2x}$
51	$y'' + 6y' = (32x + 52)e^{2x}$	52	$y'' - 6y' = (18 - 18x)e^{3x}$
53	$y'' + 7y' = (-12x - 2)e^{-x}$	54	$y'' - 7y' = (22 - 24x)e^{3x}$
55	$y'' + 8y' = (-14x - 2)e^{-x}$	56	$y'' - 8y' = (26 - 30x)e^{3x}$
57	$2y'' + y' = (10x + 9)e^{2x}$	58	$2y'' - y' = (5 - 3x)e^{-x}$
59	$3y'' + y' = (14x + 13)e^{2x}$	60	$3y'' - y' = (7 - 4x)e^{-x}$
61	$4y'' + y' = (36x + 34)e^{2x}$	62	$4y'' - y' = (18 - 10x)e^{-x}$
63	$y'' - 6y' - 7y = (15x - 58)e^{2x}$	64	$5y'' - y' = (22x - 21)e^{-2x}$
65	$y'' + 9y' + 20y = (5 - 12x)e^{-x}$	66	$6y'' - y' = (26x - 25)e^{-2x}$
67	$y'' + 7y' + 10y = (120x - 1)e^{3x}$	68	$7y'' - y' = (60x + 41)e^{3x}$
69	$y'' - 8y' + 7y = (-5x - 24)e^{2x}$	70	$8y'' - y' = (69x + 47)e^{3x}$
71	$y'' - 2y' - 15y = (15x - 17)e^{2x}$	72	$9y'' - y' = (78x + 53)e^{3x}$
73	$y'' - 9y' + 20y = (90x - 3)e^{-x}$	74	$2y'' - y' - y = (5x + 7)e^{2x}$
75	$2y'' + y' - 3y = (-18x - 13)e^{3x}$	76	$2y'' - y' - 3y = (3x + 7)e^{2x}$
77	$2y'' + y' - 6y = (-30x - 26)e^{3x}$	78	$2y'' - y' - 6y = (6x + 10)e^{-x}$
79	$y'' - 13y' + 12y = (-52x + 30)e^{-x}$	80	$5y'' + y' = (-22x - 21)e^{2x}$
81	$y'' + 13y' + 12y = (-20x + 18)e^{-2x}$	82	$6y'' + y' = (-26x - 25)e^{2x}$
83	$y'' + 7y' + 10y = (28x + 123)e^{2x}$	84	$8y'' + y' = (-7x + 15)e^{-x}$
85	$y'' - 7y' + 10y = (18x + 63)e^{-x}$	86	$y'' + 6y' - 7y = (8 - 20x)e^{3x}$
87	$y'' + 8y' + 15y = (34 - 48x)e^{3x}$	88	$y'' - 8y' + 15y = (7 - 3x)e^{2x}$
89	$y'' + 2y' - 15y = (16x - 16)e^{-x}$	90	$9y'' + y' = (-8x + 17)e^{-x}$
91	$y'' + 8y' + 7y = (27x + 120)e^{2x}$	92	$2y'' + y' - y = (20x + 13)e^{3x}$
93	$y'' + y' - 20y = (9 - 54x)e^{-2x}$	94	$7y'' + y' = (-6x + 13)e^{-x}$
95	$y'' - y' - 20y = (-42x - 29)e^{-2x}$	96	$y'' - 7y' + 10y = (-6x - 1)e^{3x}$

97	$y'' + 3y' - 10y = (40x + 53)e^{3x}$	98	$y'' + 9y' + 14y = (2 - 8x)e^{-3x}$
99	$y'' - 9y' + 14y = (100x + 120)e^{-3x}$	100	$y'' - 3y' - 10y = (5 - 50x)e^{3x}$

1.11. Задание 11

Найдите общее решение дифференциального уравнения

1. $y'' + 4y' + 5y = -4\sin 3x - 28\cos 3x$
2. $y'' - 4y' + 5y = 12\sin 3x - 4\cos 3x$
3. $y'' + 2y' + 2y = 10\cos 4x - 50\sin 4x$
4. $y'' - 2y' + 2y = 4\sin 2x - 2\cos 2x$
5. $y'' + 6y' + 13y = 69\cos 4x - 33\sin 4x$
6. $y'' - 6y' + 13y = -9\sin 4x - 72\cos 4x$
7. $y'' + 2y' + 5y = 7\sin 2x + 11\cos 2x$
8. $y'' - 2y' + 5y = -\sin 2x - 13\cos 2x$
9. $y'' + 4y' + 8y = 28\sin 2x + 16\cos 2x$
10. $y'' - 4y' + 8y = -4\sin 2x - 32\cos 2x$
11. $y'' + y = 6\cos 2x - 3\sin 2x$
12. $y'' + 4y = -5\sin 3x - 10\cos 3x$
13. $y'' + 8y' + 10y = -35\sin 5x - 150\cos 5x$
14. $y'' - 8y' + 10y = 125\sin 5x + 90\cos 5x$
15. $y'' + 6y' + 10y = -36\sin 2x - 12\cos 2x$
16. $y'' - 6y' + 10y = 12\sin 2x + 36\cos 2x$
17. $y'' + 9y = -48\sin 5x - 32\cos 5x$
18. $y'' + 25y = 16\sin 3x + 32\cos 3x$
19. $2y'' + 2y' + y = 10\sin 2x - 15\cos 2x$
20. $2y'' - 2y' + y = 40\sin 3x - 5\cos 3x$
21. $y'' + 4y' + 20y = 55\cos 5x - 35\sin 5x$
22. $y'' - 4y' + 20y = 8\cos 2x - 56\sin 2x$
23. $y'' + 8y' + 20y = -64\sin 2x - 32\cos 2x$
24. $y'' - 8y' + 20y = -64\sin 2x + 32\cos 2x$
25. $y'' + 36y = 54\sin 3x + 27\cos 3x$

26. $y'' + 49y = 135\sin 2x + 45\cos 2x$

27. $2y'' + 2y' + 13y = 57\cos 5x - 64\sin 5x$

28. $2y'' - 2y' + 13y = 16\sin 3x + 7\cos 3x$

29. $2y'' + 2y' + 5y = -46\sin 4x + 43\cos 4x$

30. $2y'' - 2y' + 5y = 32\sin 3x - \cos 3x$

31. $2y'' + 2y' + 25y = 30\sin 2x + 25\cos 2x$

32. $2y'' - 2y' + 25y = 38\sin 2x + 9\cos 2x$

33. $y'' + 64y = -78\sin 5x - 39\cos 5x$

34. $y'' + 81y = 112\cos 5x - 112\sin 5x$

35. $y'' + 100y = 150\cos 5x + 150\sin 5x$

36. $4y'' + 12y' + 25y = 15\sin 2x - 33\cos 2x$

37. $4y'' - 12y' + 25y = 14\sin 3x - 83\cos 3x$

38. $4y'' + 16y' + 25y = 59\sin 3x - 37\cos 3x$

39. $4y'' - 16y' + 25y = -70\sin 3x - 85\cos 3x$

40. $y'' + 121y = -117\sin 2x - 117\cos 2x$

41. $y'' + 4y' + 13y = 7\sin 4x + 51\cos 4x$

42. $y'' - 4y' + 13y = 15\cos 2x - 35\sin 2x$

43. $5y'' + 4y' + y = 95\cos 4x - 63\sin 4x$

44. $5y'' - 4y' + y = 32\cos 3x - 56\sin 3x$

45. $2y'' + 2y' + y = 23\cos 3x - 11\sin 3x$

46. $2y'' - 2y' + y = 28\cos 3x - 29\sin 3x$

47. $13y'' + 6y' + y = -63\sin 2x - 39\cos 2x$

48. $13y'' - 6y' + y = 63\sin 2x - 39\cos 2x$

49. $5y'' + 2y' + y = 15\sin 2x - 23\cos 2x$

50. $5y'' - 2y' + y = 11\sin 2x + 42\cos 2x$

51. $8y'' + 4y' + y = 95\sin 3x + 130\cos 3x$

52. $8y'' - 4y' + y = 71\sin 3x + 12\cos 3x$

53. $4y'' + y = 35\sin 3x + 105\cos 3x$

54. $10y'' + 8y' + y = 137\cos 3x - 154\sin 3x$

55. $10y'' - 8y' + y = 41\cos 3x - 202\sin 3x$

56. $10y'' + 6y' + y = 36\cos 3x - 178\sin 3x$

57. $10y'' - 6y' + y = 18\sin 3x - 89\cos 3x$

58. $9y'' + y = -70\sin 2x - 35\cos 2x$

59. $25y'' + y = 99\cos 2x - 99\sin 2x$

60. $20y'' + 4y' + y = 87\cos 2x - 71\sin 2x$

61. $20y'' - 4y' + y = 24\sin 2x - 237\cos 2x$

62. $20y'' + 8y' + y = 95\cos 2x - 63\sin 2x$

63. $20y'' - 8y' + y = 127\sin 2x - 221\cos 2x$

64. $36y'' + y = 143\cos 2x - 286\sin 2x$

65. $49y'' + y = 195\cos 2x - 390\sin 2x$

66. $13y'' + 2y' + 2y = 115\cos 3x + 6\sin 3x$

67. $13y'' - 2y' + 2y = 121\sin 3x - 109\cos 3x$

68. $5y'' + 2y' + 2y = -92\sin 3x - 31\cos 3x$

69. $5y'' - 2y' + 2y = 49\sin 3x - 37\cos 3x$

70. $25y'' + 2y' + 2y = -200\sin 2x - 90\cos 2x$

71. $25y'' - 2y' + 2y = 192\sin 2x + 106\cos 2x$

72. $64y'' + y = -575\sin 3x - 575\cos 3x$

73. $81y'' + y = -323\cos 2x - 323\sin 2x$

74. $100y'' + y = 399\cos 2x - 798\sin 2x$

75. $25y'' + 12y' + 4y = 120\cos 2x - 72\sin 2x$

76. $25y'' - 12y' + 4y = 144\sin 2x - 168\cos 2x$

77. $25y'' + 16y' + 4y = 221\sin 3x - 48\cos 3x$

78. $25y'' - 16y' + 4y = 320\cos 2x$

79. $121y'' + y = 483\sin 2x - 483\cos 2x$

80. $13y'' + 4y' + y = 140\sin 3x + 220\cos 3x$

81. $13y'' - 4y' + y = 35\sin 2x + 110\cos 2x$

82. $y'' + 4y' + 5y = -40\sin 5x$

83. $y'' - 4y' + 5y = -7\sin 6x - 55\cos 6x$

84. $y'' + 2y' + 2y = -46\sin 6x - 22\cos 6x$

85. $y'' - 2y' + 2y = 33\sin 5x - 13\cos 5x$

86. $y'' + 6y' + 13y = -18\sin 5x - 42\cos 5x$

87. $y'' - 6y' + 13y = 30\sin 5x - 12\cos 5x$

88. $y'' + 2y' + 5y = -5\sin 5x$

89. $y'' - 2y' + 5y = -30\sin 5x - 40\cos 5x$

90. $y'' + 4y' + 8y = 14\sin 5x - 57\cos 5x$

91. $y'' - 4y' + 8y = 32\sin 4x + 24\cos 4x$

92. $y'' + 8y' + 10y = 52\cos 4x - 76\sin 4x$

93. $y'' - 8y' + 10y = 50\sin 3x - 46\cos 3x$

94. $y'' + 6y' + 10y = -38\sin 3x - 34\cos 3x$
95. $y'' - 6y' + 10y = 38\sin 3x - 34\cos 3x$
96. $2y'' + 2y' + y = 108\cos 5x - 29\sin 5x$
97. $2y'' - 2y' + y = 88\cos 5x - 69\sin 5x$
98. $y'' + 2y' + 10y = -23\sin 3x - \cos 3x$
99. $y'' - 2y' + 10y = 25\cos 5x - 15\sin 5x$
100. $y'' + 4y' + 10y = 13\sin 3x - 35\cos 3x$

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