Лабораторная работа №5
Численные методы решения дифференциальных уравнений

№ вар	Дифференциальное уравнение	Начальные условия		Интервал
1	$y'' + y' = \frac{1}{\cos x}$	$y(0) = 1$	$y'(0) = 0$	[0 ; 0.5]
2	$(1 + x^2)y'' + (y')^2 + 1 = 0$	$y(0) = 1$	$y'(0) = 0$	[0 ; 0.5]
3	$y'' + 2 \cdot y' + 2 \cdot y = 2 \cdot e^{-x} \cdot \cos x$	$y(0) = 2$	$y'(0) = 1$	[0 ; 0.5]
4	$y'' + 4 \cdot y = e^{3 \cdot x}(13 \cdot x - 7)$	$y(0) = 0.5$	$y'(0) = 1$	[0 ; 0.25]
5	$y'' + 4 \cdot y' + 4 \cdot y = 0$	$y(0) = 3$	$y'(0) = 1.5$	[0 ; 1]
6	$y'' - y = \sin x + \cos 2x$	$y(0) = 1.8$	$y'(0) = -0.5$	[0 ; 2]
7	$y'' - 3 \cdot y' = e^{5 \cdot x}$	$y(0) = 2.2$	$y'(0) = 0.8$	[0 ; 0.25]
8	$y'' + 4 \cdot y = \cos 3x$	$y(0) = 0$	$y'(0) = 1$	[0 ; 1]
9	$y'' - y' - 6 \cdot y = 2 \cdot e^{4 \cdot x}$	$y(0) = 0$	$y'(0) = -0.3$	[0 ; 1]
10	$y'' - 2 \cdot y' + y = 5 \cdot x \cdot e^x$	$y(0) = -0.9$	$y'(0) = -0.583$	[0 ; 1]
11	$y'' + y' - 6 \cdot y = 3 \cdot x^2 - x - 1$	$y(0) = -0.9$	$y'(0) = 3.2$	[0 ; 1]
12	$8 \cdot y'' + 2 \cdot y' - 3 \cdot y = x + 5$	$y(0) = \frac{1}{9}$	$y'(0) = -\frac{7}{2}$	[0 ; 1]
13	$x^2 \cdot y'' - 2 \cdot y = 0$	$y(1) = 1$	$y'(1) = -1$	[1 ; 2]
14	$y'' - 4 \cdot y' + 5 \cdot y = 3 \cdot x$	$y(0) = 2.5$	$y'(0) = 2.2$	[0 ; 0.5]
15	$y'' - 5 \cdot y' + 6 \cdot y = e^{x^3}$	$y(0) = 0$	$y'(0) = 0$	[0 ; 0.25]
16	$y'' - 3 \cdot y' + 2 \cdot y = x^2 + 3 \cdot x$	$y(0) = 1$	$y'(0) = 1$	[0 ; 1]
17	$y'' + y = 1 + e^x$	$y(0) = 3$	$y'(0) = 2.5$	[0 ; 1]
18	$y'' + \frac{y'}{x} - \frac{y}{x^2} = 8 \cdot x$	$y(1) = 4$	$y'(1) = 2$	[1 ; 1.5]
19	$x^2 \cdot y'' + x \cdot y' = 0$	$y(1) = 1.5$	$y'(0) = 2$	[1 ; 1.5]
20	$y'' - 2 \cdot y' + y = x \cdot e^x$	$y(0) = 1$	$y'(0) = 2$	[0 ; 0.5]
21	$y'' - 3 \cdot y' + 2 \cdot y = 2 \cdot \sin x$	$y(0) = 0.5$	$y'(0) = 1$	[0 ; 1]

22	$x^2 \cdot y'' + 2.5 \cdot y' \cdot x - y = 0$	$y(1) = 2$	$y'(1) = 1$	[1 ; 2]
23	$4 \cdot x \cdot y'' + 2 \cdot y' + y = 0$	$y(1) = 1.38177$	$y'(1) = -0.15$	[1 ; 2]
24	$x^2 \cdot y'' - 4 \cdot x \cdot y' + 6 \cdot y = 2$	$y(1) = 1.433$	$y'(1) = 2.3$	[1 ; 2]
25	$y'' - y = e^{2 \cdot x}(x - 1)$	$y(0) = \frac{11}{9}$	$y'(0) = -\frac{11}{9}$	[0 ; 1]
26	$y'' - 3 \cdot y' + 2 \cdot y = \cos 2x$	$y(0) = 195$	$y'(0) = 27$	[0 ; 0.5]
27	$y'' - 0.5 \cdot y' + 0.5 \cdot y = 3 \cdot e^{\frac{x}{2}}$	$y(0) = 4$	$y'(0) = -2.5$	[0 ; 1]
28	$y'' + 4 \cdot y' + 4 \cdot y = 2 \cdot x - 3$	$y(0) = -\frac{1}{4}$	$y'(0) = -\frac{1}{2}$	[0 ; 0.5]
29	$y'' + y = x^2 - x + 2$	$y(0) = 1$	$y'(0) = 0$	[0 ; 1]
30	$y'' + 4 \cdot y = \sin x + \sin 2x$	$y(0) = 1$	$y'(0) = -\frac{23}{12}$	[0 ; 1]