Задание №5 Найти экстремали в задачах на условный экстремум:

№ варианта	
1	$V(y_1, y_2) = \int_0^1 (y_1^2 + y_2^2 + 2y_1'y_2')dx,\ y_1(0) = 1, y_1(1) = \frac{e + e^{-1}}{2}, y_2(0) = 1, y_2(1) = \frac{e + e^{-1}}{2}$ уравнение связи $y_1' + y_2' - 4x = 0$
2	$V(y_1, y_2) = \int_0^{\pi} (y_1'^2 - y_2'^2)dx,\ y_1(0) = -1, y_1(\pi) = 1, y_2(0) = 0, y_2(\pi) = -\pi$ уравнение связи $y_1' - y_2 - 2\sin x = 0$
3	$V(y_1, y_2) = \int_0^{\frac{\pi}{2}} (y_1'^2 + y_2'^2 - 2y_2^2)dx,\ y_1(0) = -4, y_1(\frac{\pi}{2}) = -\frac{\pi}{2}, y_2(0) = 0, y_2(\frac{\pi}{2}) = \frac{\pi}{2}$ уравнение связи $y_1 + y_2 + 4\cos x = 0$
4	$V(y_1, y_2) = \int_0^1 (y_1'^2 + 2y_2'^2 + y_2^2)dx,\ y_1(0) = 1, y_1(1) = 2e, y_2(0) = 0, y_2(1) = e$ уравнение связи $y_1 + y_2 + 4\cos x = 0$
5	$V(y_1, y_2) = \int_0^{\frac{\pi}{2}} (y_1'^2 - 2y_2'^2 + y_2^2)dx,\ y_1(0) = 0, y_1(\frac{\pi}{2}) = 1, y_2(0) = 0, y_2(\frac{\pi}{2}) = \frac{\pi}{2}$ уравнение связи $y_1 - y_2' = 0$
6	$V(y_1, y_2) = \int_0^{\frac{\pi}{2}} (y_1^2 + y_2^2 - y_1'^2 - y_2'^2)dx,\ y_1(0) = 1, y_1(\frac{\pi}{2}) = 1, y_2(0) = -1, y_2(\frac{\pi}{2}) = 1$ уравнение связи $y_1 - y_2 - 2\cos x = 0$
7	$V(y_1, y_2) = \int_0^1 (y_1'^2 + y_2'^2)dx,\ y_1(0) = 2, y_1(1) = 2ch\,1, y_2(0) = 0, y_2(1) = 2sh\,1$ уравнение связи $y_1' - y_2 = 0$
8	$V(y_1, y_2) = \int_0^1 (y_1^2 + 2y_1'^2 + 2y_2'^2)dx,\ y_1(0) = 1, y_1(1) = e + e^{-1}, y_2(0) = 0, y_2(1) = 2e + e^{-1}$ уравнение связи $y_1' - y_2 = 0$
9	$V(y_1, y_2) = \int_0^1 (y_1'^2 + y_2'^2)dx,\ y_1(0) = -1, y_1(1) = -1, y_2(0) = 0, y_2(1) = 1,$ уравнение связи $y_1 + y_2 - 2x^2 + x + 1 = 0$
10	$V(y_1, y_2) = \int_0^1 (y_1'^2 + y_2'^2 + 1)dx,\ y_1(0) = 0, y_1(1) = 2, y_2(0) = 0, y_2(1) = 0$ уравнение связи $y_1 + y_2 - 2x^2 = 0$

11	$V(y_1, y_2) = \int_0^{\pi} (y_1'^2 + y_2'^2)dx$, $y_1(0) = 0, y_1(\pi) = 0, y_2(0) = 0, y_2(\pi) = \frac{\pi}{2}$ уравнение связи $y_1' - y_2 - x\cos x = 0$
12	$V(y_1, y_2) = \int_0^{\frac{\pi}{2}} (y_1'^2 + y_2'^2 + 2y_1y_2)dx$, $y_1(0) = 1, y_1(\frac{\pi}{2}) = \frac{\pi^2}{4} + 1, y_2(0) = -1, y_2(\frac{\pi}{2}) = \frac{\pi^2}{4} - 1$ уравнение связи $y_1' + y_2' - 4x = 0$
13	$V(y_1, y_2) = \int_0^{1} (y_1'^2 + 2y_2y_2 + y_2'^2)dx$, $y_1(0) = 1, y_1(1) = e, y_2(0) = 1, y_2(1) = e^{-1}$ уравнение связи $y_1 - y_2 - e^x + e^{-x} = 0$
14	$V(y_1, y_2) = \int_0^{\frac{\pi}{2}} (y_1'^2 - y_2'^2)dx$, $y_1(0) = y_2(0) = 0, y_1(\frac{\pi}{2}) = \frac{\pi}{4}, y_2(\frac{\pi}{2}) = -\frac{1}{2}$ уравнение связи $y_1' - y_2 - \sin x = 0$
15	$V(y_1, y_2) = \int_0^{1} (y_1'^2 + y_2'^2)dx$, $y_1(0) = 0, y_1(1) = 1, y_2(0) = 1, y_2(1) = 0$, уравнение связи $y_1' - y_2 = 0$
16	$V(y_1, y_2) = \int_0^{1} (\sqrt{1 + y_1'^2 + y_2'^2})dx$, $y_1(0) = 1, y_1(1) = 2, y_2(0) = 2, y_2(1) = 1$ уравнение связи $2y_1 - y_2 - 3x = 0$
17	$V(y_1, y_2) = \int_0^{1} (y_1^2 + 2y_1'^2 + y_2'^2)dx$, $y_1(0) = 1, y_1(1) = e + e^{-1}, y_2(0) = 0, y_2(1) = 2e - e^{-1}$ уравнение связи $y_1' - y_2 = 0$
18	$V(y_1, y_2) = \int_1^{2} (\sqrt{1 + y_1'^2 + y_2'^2})dx$, $y_1(1) = -1, y_1(2) = 1, y_2(1) = 0, y_2(2) = -1$ уравнение связи $15x - 7y_1 + y_2 - 22 = 0$
19	$V(y_1, y_2) = \int_0^{1} (\sqrt{1 + y_1'^2 + y_2'^2})dx$, $y_1(0) = -1, y_1(1) = 0, y_2(0) = 1, y_2(1) = -1$ уравнение связи $x + y_1 + y_2 = 0$
20	$V(y_1, y_2) = \int_0^{1} (y_1'^2 + y_2'^2)dx$, $y_1(0) = 0, y_1(1) = 2\,sh\,1, y_2(0) = 2, y_2(1) = 2\,ch\,1$ уравнение связи $y_1' - y_2 = 0$