

Задача 8, вариант 5

$$y_1 = f(x) \text{ и } y_2 = g(x)$$

$$f'(x) = \frac{1}{2}f(x); \quad g'(x) = 2 - 2f(x); \quad f(0) = 0, \quad g(0) = 1$$

Рассмотреть  $y_1 = f(x)$  и  $y_2 = g(x) \rightarrow f(x+\Delta x) \approx f(x) + f'(x)\Delta x$   
[0, 20]

$$g(x) = 2f'(x); \quad g'(x) = 2 - 2f(x)$$

$$g'(x) = 2f''(x)$$

$$2f''(x) = 2 - 2f(x) \rightarrow f''(x) + f(x) = 1$$

$$f(x) = f_{\text{одн}}(x) + f_{\text{гет}}(x)$$

$$f_{\text{одн}}(x) = a \cos x + b \sin x \rightarrow f_{\text{гет}}(x) = 1$$

$$f(x) = a \cos x + b \sin x + 1$$

$$g(x) = 2f'(x) = -2a \sin x + 2b \cos x$$

$$f(0) = 0 \rightarrow a + 1 = 0, \quad a = -1$$

$$g(0) = 1 \rightarrow 2b = 1, \quad b = \frac{1}{2}$$

$$\begin{cases} f(x) = -\cos x + \frac{1}{2} \sin x + 1 \\ g(x) = 2 \sin x + \cos x \end{cases}$$

$$g(x) = 2 \sin x + \cos x$$