

ДИФФУРЫ

√1

$$y'' + y = 4 \cos x + (x^2 + 1)e^x$$

$$\lambda^2 + 1 = 0 \quad - \text{хар. уравнение}$$

$$\lambda = \pm i$$

$$y_0 = C_1 \cos x + C_2 \sin x$$

$$y = C_1 \cos x + C_2 \sin x + x(A \cos x + B \sin x) + (Cx^2 + Dx + E)e^x$$

√2

$$y''' - y'' - 6y' = e^{3x} - \sin 3x$$

$$\lambda^3 - \lambda^2 - 6\lambda = 0$$

$$\lambda_1 = 0 \quad \lambda_2 = 3 \quad \lambda_3 = -2$$

$$y = C_1 + C_2 e^{3x} + C_3 e^{-2x} + A x e^{3x} + B \cos 3x + C \sin 3x$$

√3

$$y'' - 3y' = x + e^{3x} \sin x$$

$$\lambda^2 - 3\lambda = 0$$

$$\lambda_1 = 0 \quad \lambda_2 = 3$$

$$y = C_1 + C_2 e^{3x} + x(AX + B) + e^{3x}(C \cos x + D \sin x)$$

√4

$$y'' + 2y' + 5y = 2xe^{-x} - x^2 \cos x$$

$$\lambda^2 + 2\lambda + 5 = 0$$

$$\lambda = -1 \pm 2i$$

$$y = e^{-x}(c_1 \cos 2x + c_2 \sin 2x) + e^{-x}(Ax + B) + (Cx^2 + Dx + E) \cos x + (Fx^2 + Gx + H) \sin x$$

$$\sqrt{5}$$

$$y'' - 8y' + 20y = 5xe^{4x} \sin 2x - 2x^2$$

$$\lambda^2 - 8\lambda + 20 = 0$$

$$\lambda = 4 \pm 2i$$

$$y = e^{4x}(c_1 \cos 2x + c_2 \sin 2x) + (x^2 + Bx + C) + xe^{4x}((Dx + E) \cos 2x + (Fx + G) \sin 2x)$$