

$$y^{(4)} + 2y'' + y = 0$$

$$\lambda^4 + 2\lambda^2 + 1 = (\lambda^2 + 1)^2$$

$$\lambda^2 + 1 = 0 \quad \lambda_1 = i, \lambda_2 = -i$$

$$\lambda^4 + 2\lambda^2 + 1 = [(\lambda - i) \cdot (\lambda + i)]^2 = (\lambda - i)^2 \cdot (\lambda + i)^2$$

$$\lambda_1 = i, \text{ násobnosť } 2$$

$$\lambda_2 = \bar{\lambda}_1 = -i, \quad 2$$

$$\text{FSŘ: } \varphi_1(t) = \sin t, \quad \varphi_2(t) = \cos t$$

$$\varphi_3(t) = t \cdot \sin t, \quad \varphi_4(t) = t \cdot \cos t$$

$$Y_H \dots y(t) = C_1 \cdot \sin t + C_2 \cdot \cos t + C_3 \cdot t \cdot \sin t + C_4 \cdot t \cdot \cos t,$$

$$C_1 \in \mathbb{R}, C_2 \in \mathbb{R}, C_3 \in \mathbb{R}, C_4 \in \mathbb{R}.$$

$$y^{(3)} = 0$$

$$\lambda^3 = 0 \quad \lambda_1 = 0, \text{ násobnosť } 3$$

$$\text{FSŘ: } \varphi_1(t) = 1, \quad \varphi_2(t) = t, \quad \varphi_3(t) = t^2$$

$$Y_H \dots y(t) = C_1 + C_2 \cdot t + C_3 \cdot t^2, \quad C_1 \in \mathbb{R}, C_2 \in \mathbb{R}, C_3 \in \mathbb{R}.$$