

$$y''' - 2y'' + y' = e^t$$

$$\lambda^3 - 2\lambda^2 + \lambda = \lambda^1 \cdot (\lambda - 1)^2$$

$$\lambda_1 = 0, \text{ nás. } 1; \quad \lambda_2 = -1, \text{ nás. } 2.$$

$$e^t = e^{\alpha t} \cdot [P_1(t) \cdot \cos(\beta t) + P_2(t) \cdot \sin(\beta t)]$$

$$\alpha = 1, \beta = 0; \quad P_1(t) = 1, P_2(t) = 0$$

$$s = \max \{s \in P_1, s \in P_2\} = \max \{0, -1\} = 0$$

$$\alpha + i\beta = 1, \text{ tedy } M = 2.$$

$$\text{Tvar } y_p(t) = t^2 \cdot e^t \cdot [Q_1(t)], \quad \text{st } Q_1 \in \mathbb{R}$$

$$Q_1(t) = A \in \mathbb{R}.$$

$$y_p(t) = A \cdot t^2 \cdot e^t, \quad A \in \mathbb{R}$$

$$y_p'(t) = A \cdot (t^2 + 2t) \cdot e^t$$

$$y_p''(t) = A \cdot (t^2 + 4t + 2) \cdot e^t$$

$$y_p'''(t) = A \cdot (t^2 + 6t + 6) \cdot e^t$$

Po dosazení

$$A \cdot \underbrace{(t^2 + 6t + 6)}_{mm} \cdot e^t - 2A \cdot \underbrace{(t^2 + 4t + 2)}_{mm} \cdot e^t + A \cdot \underbrace{(t^2 + 2t)}_{mm} \cdot e^t = e^t.$$

$$0 \cdot t^2 + 0 \cdot t + 6A - 4A = 1 \quad 2A = 1 \quad \underline{A = \frac{1}{2}},$$

$$y_p(t) = \frac{1}{2} t^2 \cdot e^t$$

$$y(t) = C_1 + C_2 \cdot e^t + C_3 \cdot t \cdot e^t + \frac{1}{2} t^2 \cdot e^t,$$

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