

RESI D.E. pařci: ^{y_H}komplementarno i^{y_P}n partikularno rešitev!
_{homogen}

$$\frac{dy}{dt} + 2y = 1 \quad y(0) = 1$$

$$y_K = y_H = ?$$

$$D + 2 = 0 \Rightarrow D = -2 \Rightarrow y_H = \underline{\underline{C_1 \cdot e^{-2t}}} = y_H$$

$$y_P = \int_0^t w(t-\tau) d\tau = \int_0^t w(t-\tau) d\tau$$

$$w(t) = K_1 \cdot e^{-2t}$$

$$w(0) = w(t=0) = 1$$

$$K_1 = 1$$

$$w(t) = e^{-2t}$$

$$w(t-\tau) = e^{-2(t-\tau)}$$

$$= \int_0^t e^{-2(t-\tau)} d\tau = e^{-2t} \int_0^t e^{2\tau} d\tau = e^{-2t} \left[\frac{e^{2\tau}}{2} \right]_0^t$$

$$= e^{-2t} \left[\frac{e^{2t}}{2} - \frac{1}{2} \right] = \frac{1}{2} e^{-2t}$$

$$y_s = y_H + y_P = C_1 \cdot e^{-2t} + \frac{1}{2} e^{-2t}$$

$$y_s(t=0) = 1$$

$$C_1 + \frac{1}{2} - \frac{1}{2} = 1$$

$$C_1 = 1$$

$$y_s = e^{-2t} + \frac{1}{2} - \frac{1}{2} e^{-2t} = \frac{1}{2} e^{-2t} + \frac{1}{2}$$