Ülesanne 3:

(3) KODUTÖÖ ÜL. 3

$$\begin{cases} y' = z + \alpha \\ z' = y - \beta \end{cases} \qquad \alpha = \beta = 5$$

$$\begin{cases} y' = z + 5 \\ z' = y - 5 \end{cases}$$

ilmutame z ja z' ruhtes

$$\begin{cases} z = y' - 5 \\ z' = y - 5 \end{cases}$$

$y = y_h + y_*$

(1) Lahendame homogeense võrrandi.

$y_h \Rightarrow y'' - y = 0 \Rightarrow \lambda^2 - 1 = 0, \quad \lambda = \pm 1$

$y_h = C_1 \cdot e^x + C_2 e^{-x}$

(2) Leiame eriLahendi y_*

$y_h' = C_1 e^x + C_1' e^x - C_2 e^{-x} + C_2' e^{-x}$

$y_* = A, \quad y_*' = 0, \quad y_*'' = 0 \Rightarrow 0 - A = -5$

$A = 5$

$y_* = 5$

(3) $y = C_1 \cdot e^x + C_2 e^{-x} + 5 \Rightarrow y' = C_1 e^x - C_2 e^{-x}$

$z = y' - 5$

$z = C_1 e^x - C_2 e^{-x} - 5$

$$\boxed{\begin{aligned} y &= C_1 \cdot e^x + C_2 e^{-x} + 5 \\ z &= C_1 e^x - C_2 e^{-x} - 5 \end{aligned}}$$

VASTUS