$\ddot{y} + 3\dot{y} + 2y = 0$ ← jednorodne

$x_1 = y$

$x_2 = \dot{y}$

$\dot{x}_1 = x_2$

$\ddot{y} = -3\dot{y} - 2y \Rightarrow$

$\Rightarrow \dot{x}_2 = -3x_2 - 2x_1$

$$K(s) = \frac{?}{s^2 + 3s + 2}$$

$\dot{x} = ax$

$$x = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

$\dot{x}_1 = 0x_1 + 1x_2$

$\dot{x}_2 = -2x_1 - 3x_2$

$$\dot{x} = \underbrace{\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}}_{A} \cdot x$$

$\dot{x} = Ax$

$$y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = c^T x$$

$\det(\lambda I - A) = 0$

$$\begin{vmatrix} -\lambda & 1 \\ -2 & -3-\lambda \end{vmatrix} = \lambda(3+\lambda) + 2$$

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