

$$\ddot{y} + 3\dot{y} + 2y = \dot{u} - 7u$$

$$\ddot{y} = -3\dot{y} + \dot{u} - 2y - 7u$$

$$\dot{y} = -3y + u + x_1$$

$$x_2 = y$$

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

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

$$\dot{x} = \begin{bmatrix} 0 & -2 \\ 1 & -3 \end{bmatrix} x + \begin{bmatrix} -7 \\ 1 \end{bmatrix} u$$

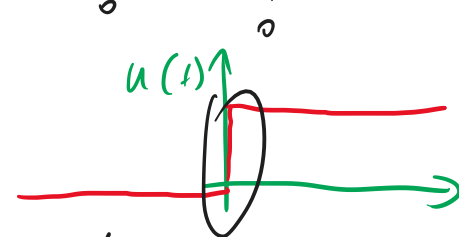
$$y = \begin{bmatrix} 0 & 1 \end{bmatrix} x$$

$$\dot{x}_1 = -2x_2 - 7u$$

$$\dot{x}_1 = 0x_1 - 2x_2 - 7u$$

$$\dot{x}_2 = 1x_1 - 3x_2 + 1u$$

$$K(s) = \frac{s-7}{s^2+3s+2} = \frac{-7}{s^2+3s+2} + \frac{s}{s^2+3s+2}$$



$$\lim_{t \rightarrow \infty} \lambda(t) = \lim_{s \rightarrow 0} s K(s) =$$

$$= \lim_{s \rightarrow 0} s \cdot \frac{1}{s} K(s) = -\frac{7}{2}$$



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