

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 2 & -1 \\ 0 & 1 & 0 \end{bmatrix}$$

# 2.2 #27

$$\lambda_1 = 1 \quad \lambda_2 = 1 \quad \lambda_3 = 1$$

$$K_1 = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$$

$K_2$   $K_3$  are missing

$$x = c_1 e^t \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} + c_2 \left[ t e^t \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} + e^t \vec{p} \right] + \vec{x}_3$$

$$(A - \lambda Id) \vec{p} = K_1 \quad p = (0, 1, 0)$$

$$\left[ \begin{array}{ccc|c} 0 & 0 & 0 & 0 \\ 2 & 1 & -1 & 1 \\ 0 & 1 & -1 & 1 \end{array} \right] \sim \left[ \begin{array}{ccc|c} 1 & 0 & 0 & 0 \\ 0 & 1 & -1 & 1 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

$$\vec{x}_3 = \frac{t^2}{2} e^t \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} + t e^t \vec{p} + e^t \vec{q}$$

$$\{A - \lambda Id\} \vec{q} = \vec{p} \quad \left[ \begin{array}{ccc|c} 0 & 0 & 0 & 0 \\ 2 & 1 & -1 & 1 \\ 0 & 1 & -1 & 0 \end{array} \right]$$

$$Q = \left( \frac{1}{2}, 0, 0 \right) \sim \left[ \begin{array}{ccc|c} 1 & 0 & 0 & 1/2 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 0 \end{array} \right]$$