

$$\frac{d}{dt} \bar{x} = A \bar{x}(t) + b(t)$$

$$S(n) \underbrace{EDO(1) LCC. NH.}$$

$$[e^{At}]$$

$$\bar{x} = e^{At} \bar{x}(0) + \int_0^t e^{A(t-z)} b(z) dz.$$

SOL GRAL HOM

SOL PARTIAL HOM

$$\frac{dx}{dt} + 2x + 4y = 1 + 4t$$

$$\frac{dy}{dt} + x - y = \frac{3}{2}t^2$$

$$\frac{dx}{dt} = -2x - 4y + 1 + 4t$$

$$\frac{dy}{dt} = -x + y + \frac{3}{2}t^2$$

$$\frac{d}{dt} \begin{bmatrix} x(t) \\ y(t) \end{bmatrix} = \begin{bmatrix} -2 & -4 \\ -1 & 1 \end{bmatrix} \cdot \begin{bmatrix} x(t) \\ y(t) \end{bmatrix} + \begin{bmatrix} 1 + 4t \\ \frac{3}{2}t^2 \end{bmatrix}$$

$$A = \nearrow$$

$$\bar{X}(0) = \begin{bmatrix} c_1 \\ c_2 \end{bmatrix} \quad \searrow \quad \bar{b}(t)$$

$$\frac{dx}{dt} = 3x - \frac{1}{2}y - 3t^2 - \frac{1}{2}t + \frac{3}{2} \quad x(0) = 1$$

$$y(0) = 1$$

$$\frac{dy}{dt} = 2y - 2t - 1$$

$$A = \begin{bmatrix} 3 & -\frac{1}{2} \\ 0 & 2 \end{bmatrix} \quad B(t) = \begin{bmatrix} -3t^2 - \frac{1}{2}t + \frac{3}{2} \\ -2t - 1 \end{bmatrix}$$