

$$\Rightarrow \begin{cases} (s-2) \mathcal{L}(x) + \mathcal{L}(y) = 2 \\ \mathcal{L}(x) + (s-2) \mathcal{L}(y) = 1 \end{cases}$$

$$\Rightarrow \begin{cases} \mathcal{L}(y) = 1 - (s-2) \mathcal{L}(x) \\ \mathcal{L}(x) + (s-2) [1 - (s-2) \mathcal{L}(x)] = 1 \end{cases}$$

$$\Rightarrow \begin{cases} \mathcal{L}(y) = 1 - (s-2) \mathcal{L}(x) \\ \mathcal{L}(x) + (s-2) - (s-2)^2 \mathcal{L}(x) = 1 \quad (*) \end{cases}$$

$$(*) \Rightarrow [1 - (s-2)^2] \mathcal{L}(x) = 1 - (s-2)$$

$$\Rightarrow [1 - s^2 + 4s - 4] \mathcal{L}(x) = 3 - s$$

$$\Rightarrow (-s^2 + 4s - 3) \mathcal{L}(x) = 3 - s$$

$$\Rightarrow \mathcal{L}(x) = \frac{3-s}{-s^2+4s-3} = \frac{s-3}{s^2-4s+3} = \frac{s-3}{(s-3)(s-1)}$$

$$= \frac{1}{s-1}$$

$$\Rightarrow \mathcal{L}(y) = 1 - (s-2) \frac{1}{s-1} = \frac{(s-1) - (s-2)}{s-1}$$

$$= \frac{s-1-s+2}{s-1} = \frac{1}{s-1}$$

$$\Rightarrow \begin{cases} \mathcal{L}(x) = \frac{1}{s-1} \\ \mathcal{L}(y) = \frac{1}{s-1} \end{cases}$$

$$\Rightarrow \begin{cases} \mathcal{L}^{-1} \mathcal{L}(x) = e^t \\ \mathcal{L}^{-1} \mathcal{L}(y) = e^t \end{cases}$$

$$\Rightarrow \begin{cases} x(t) = e^t \\ y(t) = e^t \end{cases}$$