

$$\Rightarrow s^4 \mathcal{L}(y) - s^3 y'''(0) - s^2 y''(0) - s y'(0) - y(0) - \mathcal{L}(y) = \frac{2}{s^2 - 4} \quad (07)$$

$$\Rightarrow s^4 \mathcal{L}(y) - \mathcal{L}(y) = \frac{2}{s^2 - 4}$$

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

$$= 2 \left[\frac{a}{s^2 - 4} + \frac{b}{s^2 - 1} + \frac{c}{s^2 + 1} \right]$$

après calcul

$$\mathcal{L}(y) = 2 \left[\frac{1}{15} \frac{1}{s^2 - 4} - \frac{1}{6} \frac{1}{s^2 - 1} + \frac{1}{10} \frac{1}{s^2 + 1} \right]$$

$$\Rightarrow \mathcal{L}^{-1}(\mathcal{L}(y)) = \frac{1}{15} \sin 2x - \frac{1}{3} \sin x + \frac{1}{5} \sin x$$

Exo n° 18:

$$\begin{cases} \mathcal{L}(x') = 2\mathcal{L}(x) - \mathcal{L}(y) \\ \mathcal{L}(y') = -\mathcal{L}(x) + 2\mathcal{L}(y) \end{cases} \quad x(0) = y(0) = 1$$

$$\Rightarrow \begin{cases} s\mathcal{L}(x) - x(0) = 2\mathcal{L}(x) - \mathcal{L}(y) \\ s\mathcal{L}(y) - y(0) = -\mathcal{L}(x) + 2\mathcal{L}(y) \end{cases}$$

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