

TDS Ex 5

$$\textcircled{1} \forall t \in \mathbb{R}, y(t) = \frac{2}{5} \sinh(t) - \frac{1}{5} \sin(2t)$$

$$\textcircled{2} \forall t \in \mathbb{R}, y(t) = \frac{1}{2} \sin(t) - \frac{t}{2} \cos(t)$$

$$\textcircled{3} \forall t \in \mathbb{R}, y(t) = (t + \mu) e^t + \frac{5}{2} t^2 e^t \quad \text{ai } (1, \mu) \in \mathbb{R}^2$$

$$\textcircled{4} \forall t \in \mathbb{R}, y(t) = (t + \mu) e^t - \frac{1}{4} e^{-t} \quad \text{ai } (1, \mu) \in \mathbb{R}^2$$

$$\textcircled{5} \sin^2(t) = \frac{1}{2} - \frac{1}{2} \cos(2t) \quad \text{ou procede por superposi\c{c}o\~{e}s$$

$$\forall t \in \mathbb{R}, y(t) = -\frac{1}{8} \cos(2t) + \frac{1}{8} - \frac{t}{8} \sin(2t)$$

$$\textcircled{6} \forall t \in \mathbb{R}, y(t) = \lambda e^t + \mu e^{2t} + \frac{t^2}{2} + t + \frac{5}{2} \quad \text{ai } (1, \mu) \in \mathbb{R}^2$$

$$\textcircled{7} \forall t \in \mathbb{R}, y(t) = e^t (\lambda \cos(2t) + \mu \sin(2t)) + \frac{9}{225} e^{-2t} \cos(2t) - \frac{12}{225} e^{-2t} \sin(2t)$$