

$$\begin{aligned} &> \text{restart} \\ &> \text{SolUno} := y(x) = \exp(2x) \cdot \cos(5x) \\ &\qquad\qquad\qquad \text{SolUno} := y(x) = e^{2x} \cos(5x) \end{aligned} \quad (1)$$

$$\begin{aligned} &> \text{SolDos} := y(x) = \exp(2x) \cdot \sin(5x) \\ &\qquad\qquad\qquad \text{SolDos} := y(x) = e^{2x} \sin(5x) \end{aligned} \quad (2)$$

$$\begin{aligned} &> \text{with(linalg)} : \\ &> \text{WW} := \text{wronskian}([\text{rhs}(\text{SolUno}), \text{rhs}(\text{SolDos})], x) \\ &\qquad\qquad\qquad \text{WW} := \begin{bmatrix} e^{2x} \cos(5x) & e^{2x} \sin(5x) \\ 2e^{2x} \cos(5x) - 5e^{2x} \sin(5x) & 2e^{2x} \sin(5x) + 5e^{2x} \cos(5x) \end{bmatrix} \end{aligned} \quad (3)$$

$$\begin{aligned} &> \text{Linealidad} := \text{simplify}(\det(\text{WW})) \neq 0 \\ &\qquad\qquad\qquad \text{Linealidad} := 5e^{4x} \neq 0 \end{aligned} \quad (4)$$

$$\begin{aligned} &> \text{SolGral} := y(x) = C_1 \cdot \text{rhs}(\text{SolUno}) + C_2 \cdot \text{rhs}(\text{SolDos}) \\ &\qquad\qquad\qquad \text{SolGral} := y(x) = C_1 e^{2x} \cos(5x) + C_2 e^{2x} \sin(5x) \end{aligned} \quad (5)$$

$$\begin{aligned} &> \text{Sistema} := \text{diff}(\text{SolGral}, x), \text{diff}(\text{SolGral}, x\$2) : \text{Sistema}_1; \text{Sistema}_2 \\ &\qquad\qquad\qquad \frac{d}{dx} y(x) = 2C_1 e^{2x} \cos(5x) - 5C_1 e^{2x} \sin(5x) + 2C_2 e^{2x} \sin(5x) + 5C_2 e^{2x} \cos(5x) \\ &\qquad\qquad\qquad \frac{d^2}{dx^2} y(x) = -21C_1 e^{2x} \cos(5x) - 20C_1 e^{2x} \sin(5x) - 21C_2 e^{2x} \sin(5x) + 20C_2 e^{2x} \cos(5x) \end{aligned} \quad (6)$$

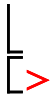
$$\begin{aligned} &> \text{Parametro} := \text{simplify}(\text{solve}(\{\text{Sistema}\}, \{C_1, C_2\})) : \text{Parametro}_1; \text{Parametro}_2 \\ &\qquad\qquad\qquad C_1 = -\frac{1}{145} e^{-2x} \left(5 \left(\frac{d^2}{dx^2} y(x) \right) \cos(5x) - 20 \left(\frac{d}{dx} y(x) \right) \cos(5x) \right. \\ &\qquad\qquad\qquad \quad \left. + 2 \left(\frac{d^2}{dx^2} y(x) \right) \sin(5x) + 21 \left(\frac{d}{dx} y(x) \right) \sin(5x) \right) \\ &\qquad\qquad\qquad C_2 = \frac{1}{145} e^{-2x} \left(2 \left(\frac{d^2}{dx^2} y(x) \right) \cos(5x) - 5 \left(\frac{d^2}{dx^2} y(x) \right) \sin(5x) \right. \\ &\qquad\qquad\qquad \quad \left. + 21 \left(\frac{d}{dx} y(x) \right) \cos(5x) + 20 \left(\frac{d}{dx} y(x) \right) \sin(5x) \right) \end{aligned} \quad (7)$$

$$\begin{aligned} &> \text{EcuacionUno} := \text{simplify}(\text{subs}(C_1 = \text{rhs}(\text{Parametro}_1), C_2 = \text{rhs}(\text{Parametro}_2), \text{SolGral})) \\ &\qquad\qquad\qquad \text{EcuacionUno} := y(x) = -\frac{1}{29} \frac{d^2}{dx^2} y(x) + \frac{4}{29} \frac{d}{dx} y(x) \end{aligned} \quad (8)$$

$$\begin{aligned} &> \text{EcuacionFinal} := \text{simplify}(\text{lhs}(\text{EcuacionUno}) \cdot 29 - \text{rhs}(\text{EcuacionUno}) \cdot 29) = 0 \\ &\qquad\qquad\qquad \text{EcuacionFinal} := 29y(x) + \frac{d^2}{dx^2} y(x) - 4 \left(\frac{d}{dx} y(x) \right) = 0 \end{aligned} \quad (9)$$

$$\begin{aligned} &> \text{Raiz}_1 := 2 + 5 \cdot I; \text{Raiz}_2 := 2 - 5 \cdot I \\ &\qquad\qquad\qquad \text{Raiz}_1 := 2 + 5I \\ &\qquad\qquad\qquad \text{Raiz}_2 := 2 - 5I \end{aligned} \quad (10)$$

$$> \text{EcuacionCaracteristica} := \text{expand}((m - \text{Raiz}_1) \cdot (m - \text{Raiz}_2)) = 0$$



$$EcuacionCaracteristica := m^2 - 4 m + 29 = 0$$

(11)