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> restart
> Ecuacion := y'' - 6 y' + 8 y = 5 * exp(-3 x)
      Ecuacion :=  $\frac{d^2}{dx^2} y(x) - 6 \left( \frac{d}{dx} y(x) \right) + 8 y(x) = 5 e^{-3x}$  (1)
> EcuaHom := lhs(Ecuacion) = 0
      EcuaHom :=  $\frac{d^2}{dx^2} y(x) - 6 \left( \frac{d}{dx} y(x) \right) + 8 y(x) = 0$  (2)
> Q := rhs(Ecuacion)
      Q :=  $5 e^{-3x}$  (3)
> EcuaCarac := m * 2 - 6 * m + 8 = 0
      EcuaCarac :=  $m^2 - 6 m + 8 = 0$  (4)
> Raiz := solve(EcuaCarac)
      Raiz := 4, 2 (5)
> SolUno := y(x) = exp(Raiz_1 * x)
      SolUno :=  $y(x) = e^{4x}$  (6)
> SolDos := y(x) = exp(Raiz_2 * x)
      SolDos :=  $y(x) = e^{2x}$  (7)
> SolHom := y(x) = C_1 * rhs(SolUno) + C_2 * rhs(SolDos)
      SolHom :=  $y(x) = C_1 e^{4x} + C_2 e^{2x}$  (8)
> SolHomDos := dsolve(EcuaHom)
      SolHomDos :=  $y(x) = \_C1 e^{4x} + \_C2 e^{2x}$  (9)
> SolNoHom := y(x) = A * rhs(SolUno) + B * rhs(SolDos)
      SolNoHom :=  $y(x) = A e^{4x} + B e^{2x}$  (10)
> with(linalg) :
> WW := wronskian([rhs(SolUno), rhs(SolDos)], x)
      WW :=  $\begin{bmatrix} e^{4x} & e^{2x} \\ 4 e^{4x} & 2 e^{2x} \end{bmatrix}$  (11)
> BB := array([0, Q])
      BB :=  $\begin{bmatrix} 0 & 5 e^{-3x} \end{bmatrix}$  (12)
> PRIMAS := simplify(linsolve(WW, BB))
      PRIMAS :=  $\begin{bmatrix} \frac{5}{2} e^{-7x} & -\frac{5}{2} e^{-5x} \end{bmatrix}$  (13)
> Aprima := PRIMAS_1; Bprima := PRIMAS_2
      Aprima :=  $\frac{5}{2} e^{-7x}$ 
      Bprima :=  $-\frac{5}{2} e^{-5x}$  (14)
> A := int(Aprima, x) + C_1; B := int(Bprima, x) + C_2

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$$A := -\frac{5}{14} e^{-7x} + C_1$$

$$B := \frac{1}{2} e^{-5x} + C_2 \quad (15)$$

> *SolucionFinal* := simplify(*SolNoHom*)

$$\textit{SolucionFinal} := y(x) = \frac{1}{7} e^{-3x} + C_1 e^{4x} + C_2 e^{2x} \quad (16)$$

> *SolFinal* := expand(simplify(dsolve(*Ecuacion*)))

$$\textit{SolFinal} := y(x) = \frac{1}{7 (e^x)^3} + \frac{1}{2} (e^x)^4 _C1 + (e^x)^2 _C2 \quad (17)$$

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