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> restart
> Ecuacion := y''' + sqrt(2)y'' + 4 y' + 4·sqrt(2)y = 0
      Ecuacion :=  $\frac{d^3}{dx^3} y(x) + \sqrt{2} \left( \frac{d^2}{dx^2} y(x) \right) + 4 \left( \frac{d}{dx} y(x) \right) + 4 \sqrt{2} y(x) = 0$  (1)
> Solgral := dsolve(Ecuacion)
      Solgral :=  $y(x) = \_C1 e^{-\sqrt{2} x} + \_C2 \sin(2 x) + \_C3 \cos(2 x)$  (2)
> restart
> Ecua := y''' - 14 y'' + 65 y' - 100 y = 0
      Ecua :=  $\frac{d^3}{dx^3} y(x) - 14 \left( \frac{d^2}{dx^2} y(x) \right) + 65 \left( \frac{d}{dx} y(x) \right) - 100 y(x) = 0$  (3)
> SolGral := dsolve(Ecua)
      SolGral :=  $y(x) = \_C1 e^{4x} + \_C2 e^{5x} + \_C3 e^{5x} x$  (4)
> restart
> Ecua := y'' - 4 y' + 3 y = 5·exp(5 x)
      Ecua :=  $\frac{d^2}{dx^2} y(x) - 4 \left( \frac{d}{dx} y(x) \right) + 3 y(x) = 5 e^{5x}$  (5)
> SolGral := dsolve(Ecua)
      SolGral :=  $y(x) = e^x \_C2 + e^{3x} \_C1 + \frac{5}{8} e^{5x}$  (6)
> restart
> Ecuacion := y'' + 2 y' + 2 y = 2·exp(x) + x^2 + cos(2 x)
      Ecuacion :=  $\frac{d^2}{dx^2} y(x) + 2 \left( \frac{d}{dx} y(x) \right) + 2 y(x) = 2 e^x + x^2 + \cos(2 x)$  (7)
> SolPart := y(x) = A·exp(x) + B·x^2 + D·x + E + F·cos(2 x) + G·sin(2 x)
      SolPart :=  $y(x) = A e^x + B x^2 + D x + E + F \cos(2 x) + G \sin(2 x)$  (8)
> Parametros := eval(subs(y(x) = rhs(SolPart), Ecuacion))
      Parametros :=  $5 A e^x + 2 B - 2 F \cos(2 x) - 2 G \sin(2 x) + 4 B x + 2 D - 4 F \sin(2 x)$  (9)
       $+ 4 G \cos(2 x) + 2 B x^2 + 2 D x + 2 E = 2 e^x + x^2 + \cos(2 x)$ 
> EcuaUno := 5·A = 2
      EcuaUno :=  $5 A = 2$  (10)
> EcuaDos := -2·F + 4·G = 1
      EcuaDos :=  $-2 F + 4 G = 1$  (11)
> EcuaTres := -2·G - 4·F = 0
      EcuaTres :=  $-2 G - 4 F = 0$  (12)
> EcuaCuatro := 2·B = 1
      EcuaCuatro :=  $2 B = 1$  (13)
> EcuaCinco := 4·B + 2·D = 0
      EcuaCinco :=  $4 B + 2 D = 0$  (14)
> EcuaSeis := 2·B + 2·D + 2·E = 0
      EcuaSeis :=  $2 B + 2 D + 2 E = 0$  (15)
> with(linalg) :

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$$\begin{aligned} &> \text{Para} := \text{solve}(\{ \text{EcuaUno}, \text{EcuaDos}, \text{EcuaTres}, \text{EcuaCuatro}, \text{EcuaCinco}, \text{EcuaSeis} \}) \\ &\quad \text{Para} := \left\{ A = \frac{2}{5}, B = \frac{1}{2}, D = -1, E = \frac{1}{2}, F = -\frac{1}{10}, G = \frac{1}{5} \right\} \end{aligned} \quad (16)$$

$$\begin{aligned} &> \text{SolGral} := \_C1 \cdot \exp(-x) \cdot \cos(x) + \_C2 \cdot \exp(-x) \cdot \sin(x) + A \cdot \exp(x) + B \cdot x^2 + D \cdot x + E + F \\ &\quad \cdot \cos(2 \cdot x) + G \cdot \sin(2 \cdot x) \\ &\text{SolGral} := \_C1 e^{-x} \cos(x) + \_C2 e^{-x} \sin(x) + A e^x + B x^2 + D x + E + F \cos(2 x) + G \sin(2 x) \end{aligned} \quad (17)$$

$$\begin{aligned} &> \text{SolCompleta} := \text{subs}(A = \text{rhs}(\text{Para}[1]), B = \text{rhs}(\text{Para}[2]), D = \text{rhs}(\text{Para}[3]), E \\ &\quad = \text{rhs}(\text{Para}[4]), F = \text{rhs}(\text{Para}[5]), G = \text{rhs}(\text{Para}[6]), \text{SolGral}) \\ &\text{SolCompleta} := \_C1 e^{-x} \cos(x) + \_C2 e^{-x} \sin(x) + \frac{2}{5} e^x + \frac{1}{2} x^2 - x + \frac{1}{2} - \frac{1}{10} \cos(2 x) \\ &\quad + \frac{1}{5} \sin(2 x) \end{aligned} \quad (18)$$

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