> $restart$

> $Ecua := y''' = 32\cdot\exp(2\,x) + 40\cdot\sin(2\,x)$

$$Ecua := \frac{d^3}{dx^3}\,y(x) = 32\,e^{2\,x} + 40\,\sin(2\,x) \tag{1}$$

> $SolaGral := dsolve(Ecua)$

$$SolaGral := y(x) = \frac{c_1\,x^2}{2} + 4\,e^{2\,x} + 5\,\cos(2\,x) + c_2\,x + c_3 \tag{2}$$

> $restart$

> $Ecua := y''' - 6\cdot y'' = 2\cdot\exp(2\,x)$

$$Ecua := \frac{d^3}{dx^3}\,y(x) - 6\,\frac{d^2}{dx^2}\,y(x) = 2\,e^{2\,x} \tag{3}$$

> $EcuaHom := lhs(Ecua) = 0$

$$EcuaHom := \frac{d^3}{dx^3}\,y(x) - 6\,\frac{d^2}{dx^2}\,y(x) = 0 \tag{4}$$

> $Q := rhs(Ecua)$

$$Q := 2\,e^{2\,x} \tag{5}$$

> $EcuaCarac := m^3 - 6\cdot m^2 = 0$

$$EcuaCarac := m^3 - 6\,m^2 = 0 \tag{6}$$

> $Raiz := solve(EcuaCarac)$

$$Raiz := 6, 0, 0 \tag{7}$$

> $yy[1] := \exp(Raiz[1]\cdot x); yy[2] := \exp(Raiz[2]\cdot x); yy[3] := x\cdot\exp(Raiz[3]\cdot x);$

$$yy_1 := e^{6\,x}$$

$$yy_2 := 1$$

$$yy_3 := x \tag{8}$$

> $SolHom := y(x) = \_C1\cdot yy[1] + \_C2\cdot yy[2] + \_C3\cdot yy[3]$

$$SolHom := y(x) = \_C1\,e^{6\,x} + \_C2 + \_C3\,x \tag{9}$$

> $SolGral := y(x) = AA\cdot yy[1] + BB\cdot yy[2] + DD\cdot yy[3]$

$$SolGral := y(x) = AA\,e^{6\,x} + BB + DD\,x \tag{10}$$

> $with(linalg):$

> $WW := wronskian([yy[1], yy[2], yy[3]], x)$

$$WW := \begin{bmatrix} e^{6\,x} & 1 & x \\ 6\,e^{6\,x} & 0 & 1 \\ 36\,e^{6\,x} & 0 & 0 \end{bmatrix} \tag{11}$$

> $BB := array([0, 0, Q])$

$$BB := \begin{bmatrix} 0 & 0 & 2\,e^{2\,x} \end{bmatrix} \tag{12}$$

> $ParaVar := linsolve(WW, BB)$

$$ParaVar := \left[\frac{e^{2x}}{18\, e^{6x}} \quad \frac{e^{2x}\, x}{3} - \frac{e^{2x}}{18} \quad -\frac{e^{2x}}{3} \right] \tag{13}$$

> $AAprima := ParaVar[1];\ BBprima := ParaVar[2];\ DDprima := ParaVar[3]$

$$AAprima := \frac{e^{2x}}{18\, e^{6x}}$$

$$BBprima := \frac{e^{2x}\, x}{3} - \frac{e^{2x}}{18}$$

$$DDprima := -\frac{e^{2x}}{3} \tag{14}$$

> $AA := int(AAprima, x) + \_C1$

$$AA := -\frac{e^{2x}}{72\, e^{6x}} + \_C1 \tag{15}$$

> $BB := int(BBprima, x) + \_C2$

$$BB := \frac{e^{2x}\,(3x-2)}{18} + \_C2 \tag{16}$$

> $DD := int(DDprima, x) + \_C3$

$$DD := -\frac{e^{2x}}{6} + \_C3 \tag{17}$$

> $SolFinal := simplify(SolGral)$

$$SolFinal := y(x) = -\frac{e^{2x}}{8} + \_C1\, e^{6x} + \_C2 + \_C3\, x \tag{18}$$

> $restart$

> $SolGral := y(x) = \_C1 \cdot x^2 + \_C2 \cdot x + \_C3 + 4 \cdot \exp(2x) + 5 \cdot \cos(2x)$

$$SolGral := y(x) = \_C1\, x^2 + \_C2\, x + \_C3 + 4\, e^{2x} + 5\cos(2x) \tag{19}$$

> $CondIni := y(0) = 3, D(y)(0) = -2, D(D(y))(0) = 6$

$$CondIni := y(0) = 3, D(y)(0) = -2, D^{(2)}(y)(0) = 6 \tag{20}$$

> $EcuaUno := simplify(subs(x = 0, rhs(SolGral) = 3))$

$$EcuaUno := \_C3 + 9 = 3 \tag{21}$$

> $EcuaDos := simplify(subs(x = 0, rhs(diff(SolGral, x)) = -2))$

$$EcuaDos := \_C2 + 8 = -2 \tag{22}$$

> $EcuaTres := simplify(subs(x = 0, rhs(diff(SolGral, x\$2)) = 6))$

$$EcuaTres := 2\,\_C1 - 4 = 6 \tag{23}$$

> $Para[3] := isolate(EcuaUno, \_C3)$

$$Para_3 := \_C3 = -6 \tag{24}$$

> $Para[2] := isolate(EcuaDos, \_C2)$

$$Para_2 := \_C2 = -10 \tag{25}$$

> $Para[1] := isolate(EcuaTres, \_C1)$

$$Para_1 := \_C1 = 5 \tag{26}$$

> $SolPart := subs(\_C1 = rhs(Para[1]), \_C2 = rhs(Para[2]), \_C3 = rhs(Para[3]), SolGral)$

$$SolPart := y(x) = 5\,x^2 - 10\,x - 6 + 4\,e^{2\,x} + 5\cos(2\,x) \tag{27}$$

> $with(linalg):$

> $ParaCte := solve([EcuaUno, EcuaDos, EcuaTres])$

$$ParaCte := \{\_C1 = 5, \_C2 = -10, \_C3 = -6\} \tag{28}$$

>

> $SolPartDos := subs(ParaCte, SolGral)$

$$SolPartDos := y(x) = 5\,x^2 - 10\,x - 6 + 4\,e^{2\,x} + 5\cos(2\,x) \tag{29}$$

>