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> restart
> EDO := y'' - 3·y' + 6·y = 0

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$$EDO := \frac{d^2}{dx^2} y(x) - 3 \frac{d}{dx} y(x) + 6 y(x) = 0 \quad (1)$$

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> EDODos := diff(x(t), t$2) - 3·diff(x(t), t) + 6·x(t) = 0

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$$EDODos := \frac{d^2}{dt^2} x(t) - 3 \frac{d}{dt} x(t) + 6 x(t) = 0 \quad (2)$$

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> CondIni := x(0) = 5, D(x)(0) = -4

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$$CondIni := x(0) = 5, D(x)(0) = -4 \quad (3)$$

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> EDOTres := diff(Y(t), t$3) = -4·cos(2·Pi)

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$$EDOTres := \frac{d^3}{dt^3} Y(t) = -4 \quad (4)$$

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> CondIniTres := Y(0) = 4, D(Y)(0) = -5, D(D(Y))(0) = 6

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$$CondIniTres := Y(0) = 4, D(Y)(0) = -5, D^{(2)}(Y)(0) = 6 \quad (5)$$

```

> restart
> SolGral := y(x) = _C1·exp(-3 x) + _C2·exp(2 x)

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$$SolGral := y(x) = _C1 e^{-3x} + _C2 e^{2x} \quad (6)$$

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> DSol := diff(SolGral, x)

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$$DSol := \frac{d}{dx} y(x) = -3 _C1 e^{-3x} + 2 _C2 e^{2x} \quad (7)$$

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> DDSol := diff(SolGral, x$2)

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$$DDSol := \frac{d^2}{dx^2} y(x) = 9 _C1 e^{-3x} + 4 _C2 e^{2x} \quad (8)$$

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> Sist := DSol, DDSol

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$$Sist := \frac{d}{dx} y(x) = -3 _C1 e^{-3x} + 2 _C2 e^{2x}, \frac{d^2}{dx^2} y(x) = 9 _C1 e^{-3x} + 4 _C2 e^{2x} \quad (9)$$

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> Para[1] := isolate( Sist[1]·(3) + Sist[2], _C2)

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$$Para_1 := _C2 = - \frac{-3 \frac{d}{dx} y(x) - \frac{d^2}{dx^2} y(x)}{10 e^{2x}} \quad (10)$$

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> Para[2] := isolate( Sist[1]·(-2) + Sist[2], _C1)

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$$Para_2 := _C1 = - \frac{2 \frac{d}{dx} y(x) - \frac{d^2}{dx^2} y(x)}{15 e^{-3x}} \quad (11)$$

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> SolGral

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$$y(x) = _C1 e^{-3x} + _C2 e^{2x} \quad (12)$$

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> Ecua := subs(_C2 = rhs(Para[1]), _C1 = rhs(Para[2]), SolGral)

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$$Ecua := y(x) = \frac{\frac{d}{dx} y(x)}{6} + \frac{\frac{d^2}{dx^2} y(x)}{6} \quad (13)$$

> $EcuaDos := lhs(Ecua) \cdot 6 = rhs(Ecua) \cdot 6$

$$EcuaDos := 6 y(x) = \frac{d}{dx} y(x) + \frac{d^2}{dx^2} y(x) \quad (14)$$

> $EcuaFinal := rhs(EcuaDos) - lhs(EcuaDos) = 0$

$$EcuaFinal := \frac{d}{dx} y(x) + \frac{d^2}{dx^2} y(x) - 6 y(x) = 0 \quad (15)$$

> restart

> $Ecua := y'' + y = 6 \cdot x^2$

$$Ecua := \frac{d^2}{dx^2} y(x) + y(x) = 6 x^2 \quad (16)$$

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

$$EcuaHom := \frac{d^2}{dx^2} y(x) + y(x) = 0 \quad (17)$$

> $Q := rhs(Ecua)$

$$Q := 6 x^2 \quad (18)$$

> $EcuaCarac := m^2 + 1 = 0$

$$EcuaCarac := m^2 + 1 = 0 \quad (19)$$

> $Raiz := solve(EcuaCarac)$

$$Raiz := I, -I \quad (20)$$

> $yy[1] := \cos(\text{Im}(Raiz[1]) \cdot x)$

$$yy_1 := \cos(x) \quad (21)$$

> $yy[2] := \sin(\text{Im}(Raiz[1]) \cdot x)$

$$yy_2 := \sin(x) \quad (22)$$

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

$$SolHom := y(x) = _C1 \cos(x) + _C2 \sin(x) \quad (23)$$

> $ComprobarCero := simplify(eval(subs(y(x) = rhs(SolHom), EcuaHom)))$

$$ComprobarCero := 0 = 0 \quad (24)$$

> with(linalg) :

> $WW := \text{wronskian}([yy[1], yy[2]], x)$

$$WW := \begin{bmatrix} \cos(x) & \sin(x) \\ -\sin(x) & \cos(x) \end{bmatrix} \quad (25)$$

> $BB := \text{array}([0, Q])$

$$BB := \begin{bmatrix} 0 & 6 x^2 \end{bmatrix} \quad (26)$$

> $Para := simplify(\text{linsolve}(WW, BB))$

$$Para := \begin{bmatrix} -6 \sin(x) x^2 & 6 \cos(x) x^2 \end{bmatrix} \quad (27)$$

> *Aprima* := *Para*[1]; *Bprima* := *Para*[2]

$$Aprima := -6 \sin(x) x^2$$

$$Bprima := 6 \cos(x) x^2 \quad (28)$$

> *SolGral* := *y*(*x*) = *simplify*((*int*(*Aprima*, *x*) + *_C1*)·*yy*[1] + (*int*(*Bprima*, *x*) + *_C2*)·*yy*[2])

$$SolGral := y(x) = _C1 \cos(x) + _C2 \sin(x) + 6 x^2 - 12 \quad (29)$$

> *Comprobar* := *simplify*(*eval*(*subs*(*y*(*x*) = *rhs*(*SolGral*), *Ecua*)))

$$Comprobar := 6 x^2 = 6 x^2 \quad (30)$$

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