```
> restart
> Ecua := diff(x(t), t$2) - 7·diff(x(t), t) + 12·x(t) = cos(3·t) + t^2
```

$$Ecua := \frac{d^2}{dt^2} x(t) - 7\left(\frac{d}{dt} x(t)\right) + 12\,x(t) = \cos(3\,t) + t^2 \tag{1}$$

```
> SolGral := dsolve(Ecua)
```

$$SolGral := x(t) = e^{3t}\_C2 + e^{4t}\_C1 + \frac{1}{12} t^2 + \frac{1}{150}\cos(3\,t) - \frac{7}{150}\sin(3\,t) + \frac{7}{72} t + \frac{37}{864} \tag{2}$$

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

$$EcuaHom := \frac{d^2}{dt^2} x(t) - 7\left(\frac{d}{dt} x(t)\right) + 12\,x(t) = 0 \tag{3}$$

```
> Q := rhs(Ecua)
```

$$Q := \cos(3\,t) + t^2 \tag{4}$$

```
> EcuaCarac := m^2 - 7·m + 12 = 0
```

$$EcuaCarac := m^2 - 7\,m + 12 = 0 \tag{5}$$

```
> Raiz := solve(EcuaCarac)
```

$$Raiz := 4, 3 \tag{6}$$

```
> xx[1] := exp(Raiz[1]·t)
```

$$xx_1 := e^{4t} \tag{7}$$

```
> xx[2] := exp(Raiz[2]·t)
```

$$xx_2 := e^{3t} \tag{8}$$

```
> SolHom := x(t) = _C1·xx[1] + _C2·xx[2]
```

$$SolHom := x(t) = e^{4t}\_C1 + e^{3t}\_C2 \tag{9}$$

```
> SolNoHom := x(t) = AA·xx[1] + BB·xx[2]
```

$$SolNoHom := x(t) = AA\,e^{4t} + BB\,e^{3t} \tag{10}$$

```
> with(linalg) :
> WW := wronskian([xx[1], xx[2]], t)
```

$$WW := \begin{bmatrix} e^{4t} & e^{3t} \\ 4\,e^{4t} & 3\,e^{3t} \end{bmatrix} \tag{11}$$

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

$$BB := \begin{bmatrix} 0 & \cos(3\,t) + t^2 \end{bmatrix} \tag{12}$$

```
> Parametro := linsolve(WW, BB)
```

$$Parametro := \begin{bmatrix} \dfrac{\cos(3\,t) + t^2}{e^{4t}} & -\dfrac{\cos(3\,t) + t^2}{e^{3t}} \end{bmatrix} \tag{13}$$

```
> Aprima := Parametro[1]; Bprima := Parametro[2]
```

$$Aprima := \frac{\cos(3\,t) + t^2}{e^{4t}}$$

$$Bprima := -\frac{\cos(3\,t) + t^2}{e^{3t}} \tag{14}$$

> $AA := simplify(int(Aprima, t) + \_C1); BB := simplify(int(Bprima, t) + \_C2)$

$$AA := \frac{1}{800}\left(384\sin(t)\cos(t)^2 - 512\cos(t)^3 - 96\sin(t) + 384\cos(t) + 800\,e^{4t}\_C1 - 200\,t^2 - 100\,t - 25\right)e^{-4t}$$

$$BB := \frac{1}{54}\left(9\cos(3t) - 9\sin(3t) + 54\,e^{3t}\_C2 + 18\,t^2 + 12\,t + 4\right)e^{-3t} \quad \textbf{(15)}$$

> $SolFinal := simplify(SolNoHom)$

$$SolFinal := x(t) = \frac{12}{25}\sin(t)\cos(t)^2 - \frac{16}{25}\cos(t)^3 + e^{3t}\_C2 + \frac{1}{12}t^2 + e^{4t}\_C1 + \frac{1}{6}\cos(3t) - \frac{3}{25}\sin(t) - \frac{1}{6}\sin(3t) + \frac{7}{72}t + \frac{12}{25}\cos(t) + \frac{37}{864} \quad \textbf{(16)}$$

> $SolGral$

$$x(t) = e^{3t}\_C2 + e^{4t}\_C1 + \frac{1}{12}t^2 + \frac{1}{150}\cos(3t) - \frac{7}{150}\sin(3t) + \frac{7}{72}t + \frac{37}{864} \quad \textbf{(17)}$$

> $Comprobar := simplify(eval(subs(x(t) = rhs(SolFinal), lhs(Ecua) - rhs(Ecua) = 0)))$

$$Comprobar := 0 = 0 \quad \textbf{(18)}$$

> $ComprobarDos := simplify(eval(subs(x(t) = rhs(SolGral), lhs(Ecua) - rhs(Ecua) = 0)))$

$$ComprobarDos := 0 = 0 \quad \textbf{(19)}$$

>

>

>

>