```
> restart
> EcuaCarac := expand( (m-2)^2·(m-2+3·I)·(m-2-3·I) ) = 0
```

$$EcuaCarac := m^4 - 8\,m^3 + 33\,m^2 - 68\,m + 52 = 0 \quad (1)$$

```
> EcuaDif := y''''-8·y'''+33·y''-68·y'+52·y = 0
```

$$EcuaDif := \frac{d^4}{dx^4}\,y(x) - 8\,\frac{d^3}{dx^3}\,y(x) + 33\,\frac{d^2}{dx^2}\,y(x) - 68\,\frac{d}{dx}\,y(x) + 52\,y(x) = 0 \quad (2)$$

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

$$SolGral := y(x) = c_1\,e^{2x} + c_2\,e^{2x}\,x + c_3\,e^{2x}\sin(3x) + c_4\,e^{2x}\cos(3x) \quad (3)$$

```
> restart
> Sistema := 5·D = 8, 5·B-12·D = 0, 5·A-6·B+2·D = 0, -3·E = -6 : Sistema[1];
    Sistema[2]; Sistema[3]; Sistema[4]
```

$$5\,D = 8$$
$$5\,B - 12\,D = 0$$
$$5\,A - 6\,B + 2\,D = 0$$
$$-3\,E = -6 \quad (4)$$

```
> with(linalg) :
> Para := solve( [Sistema] )
```

$$Para := \left\{A = \frac{496}{125}, B = \frac{96}{25}, D = \frac{8}{5}, E = 2\right\} \quad (5)$$

```
> SolGral := y(x) = subs( Para, (_C1·exp(x) + _C2·exp(5·x) + A + B·x + D·x^2 + E·x
    ·exp(x)) )
```

$$SolGral := y(x) = \_C1\,e^{x} + \_C2\,e^{5x} + \frac{496}{125} + \frac{96\,x}{25} + \frac{8\,x^2}{5} + 2\,x\,e^{x} \quad (6)$$

```
> Ecua := y''-6·y'+5·y = 8·x^2-6·exp(x)
```

$$Ecua := \frac{d^2}{dx^2}\,y(x) - 6\,\frac{d}{dx}\,y(x) + 5\,y(x) = 8\,x^2 - 6\,e^{x} \quad (7)$$

```
> Comprobar := simplify(eval(subs(y(x) = rhs(SolGral), lhs(Ecua) - rhs(Ecua) = 0)))
```

$$Comprobar := -2\,e^{x} = 0 \quad (8)$$

```
> restart
> Ecua := y''-6·y'+5·y = 8·x^2-6·exp(x)
```

$$Ecua := \frac{d^2}{dx^2}\,y(x) - 6\,\frac{d}{dx}\,y(x) + 5\,y(x) = 8\,x^2 - 6\,e^{x} \quad (9)$$

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

$$EcuaHom := \frac{d^2}{dx^2}\,y(x) - 6\,\frac{d}{dx}\,y(x) + 5\,y(x) = 0 \quad (10)$$

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

$$Q := 8\,x^2 - 6\,e^{x} \quad (11)$$

```
> SolGral := y(x) = A·exp(x) + B·exp(5·x)
```

(12)

$$SolGral := y(x) = A\,e^{x} + B\,e^{5\,x} \tag{12}$$

> $Sistema := Aprima\cdot\exp(x) + Bprima\cdot\exp(5\,x) = 0,\ Aprima\cdot\exp(x) + 5\cdot Bprima\cdot\exp(5\cdot x) = Q$

$$Sistema := Aprima\,e^{x} + Bprima\,e^{5\,x} = 0,\ Aprima\,e^{x} + 5\,Bprima\,e^{5\,x} = 8\,x^{2} - 6\,e^{x} \tag{13}$$

> $Parametro := solve([Sistema])$

$$Parametro := \left\{Aprima = \frac{-4\,x^{2} + 3\,e^{x}}{2\,e^{x}},\ Bprima = -\frac{-4\,x^{2} + 3\,e^{x}}{2\,\left(e^{x}\right)^{5}},\ x = x\right\} \tag{14}$$

> $A := int(rhs(Parametro[1]), x) + \_C1$

$$A := \frac{3\,x}{2} + \frac{2\,x^{2}}{e^{x}} + \frac{4\,x}{e^{x}} + \frac{4}{e^{x}} + \_C1 \tag{15}$$

> $B := int(rhs(Parametro[2]), x) + \_C2$

$$B := \frac{3}{8\,\left(e^{x}\right)^{4}} - \frac{2\,x^{2}}{5\,\left(e^{x}\right)^{5}} - \frac{4\,x}{25\,\left(e^{x}\right)^{5}} - \frac{4}{125\,\left(e^{x}\right)^{5}} + \_C2 \tag{16}$$

> $SolGral := y(x) = expand(simplify(A\cdot\exp(x) + B\cdot\exp(5\cdot x)))$

$$SolGral := y(x) = \frac{3\,e^{x}\,x}{2} + \frac{8\,x^{2}}{5} + \frac{96\,x}{25} + \frac{496}{125} + e^{x}\,\_C1 + \frac{3\,e^{x}}{8} + \left(e^{x}\right)^{5}\,\_C2 \tag{17}$$

>