> *restart*

> $Ecua := m^3 + m^2 + m + 1 = 0$

$$Ecua := m^3 + m^2 + m + 1 = 0 \tag{1}$$

> $Raiz := solve(Ecua) : evalf(\%, 3)$

$$-1., 1.\ I, -1.\ I \tag{2}$$

> *restart*

> $Ecua := y''' + y'' + y' + y = 5 \cdot \exp(-x) + \cos(2 \cdot x)$

$$Ecua := \frac{d^3}{dx^3}\ y(x) + \frac{d^2}{dx^2}\ y(x) + \frac{d}{dx}\ y(x) + y(x) = 5\ e^{-x} + \cos(2\ x) \tag{3}$$

> $SolNoHom := y(x) = A \cdot x \cdot \exp(-x) + B \cdot \cos(2\ x) + D \cdot \sin(2\ x)$

$$SolNoHom := y(x) = A\ x\ e^{-x} + B\cos(2\ x) + D\sin(2\ x) \tag{4}$$

> $Para := simplify(eval(subs(y(x) = rhs(SolNoHom), Ecua)))$

$$Para := 2\ A\ e^{-x} + 6\ B\sin(2\ x) - 6\ D\cos(2\ x) - 3\ B\cos(2\ x) - 3\ D\sin(2\ x) = 5\ e^{-x} + \cos(2\ x) \tag{5}$$

> $with(linalg) :$

> $solve([2 \cdot A = 5, (6\ B - 3 \cdot D) = 0, (-6\ D - 3\ B) = 1])$

$$\left\{ A = \frac{5}{2},\ B = -\frac{1}{15},\ D = -\frac{2}{15} \right\} \tag{6}$$

> $SolGral := y(x) = \_C1 \cdot \cos(x) + \_C2 \cdot \sin(x) + \_C3 \cdot \exp(-x) + \frac{5}{2} \cdot x \cdot \exp(-x) - \frac{1}{15} \cdot \cos(2\ x)$
$$- \frac{2}{15} \cdot \sin(2\ x)$$

$$SolGral := y(x) = \_C1\cos(x) + \_C2\sin(x) + \_C3\ e^{-x} + \frac{5}{2}\ x\ e^{-x} - \frac{1}{15}\cos(2\ x) \tag{7}$$
$$- \frac{2}{15}\sin(2\ x)$$

> $Ecua$

$$\frac{d^3}{dx^3}\ y(x) + \frac{d^2}{dx^2}\ y(x) + \frac{d}{dx}\ y(x) + y(x) = 5\ e^{-x} + \cos(2\ x) \tag{8}$$

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

$$Comprobar := 0 = 0 \tag{9}$$

>