

```

> restart
> Sistema := diff(x[1](t), t) = 2·x[1](t) + 3·x[2](t), diff(x[2](t), t) = x[1](t) + 4·x[2](t) :
  Sistema[1]; Sistema[2]

```

$$\frac{d}{dt} x_1(t) = 2 x_1(t) + 3 x_2(t)$$

$$\frac{d}{dt} x_2(t) = x_1(t) + 4 x_2(t) \quad (1)$$

```

> Solucion := dsolve({Sistema}, {x[1](t), x[2](t)}) : Solucion[1]; Solucion[2]

```

$$x_1(t) = c_1 e^t + c_2 e^{5t}$$

$$x_2(t) = -\frac{c_1 e^t}{3} + c_2 e^{5t} \quad (2)$$

```

> ComprobarUno := simplify(eval(subs(x[1](t) = rhs(Solucion[1]), x[2](t)
  = rhs(Solucion[2]), lhs(Sistema[1]) - rhs(Sistema[1]) = 0)))
  ComprobarUno := 0 = 0

```

```

> ComprobarDos := simplify(eval(subs(x[1](t) = rhs(Solucion[1]), x[2](t)
  = rhs(Solucion[2]), lhs(Sistema[2]) - rhs(Sistema[2]) = 0)))
  ComprobarDos := 0 = 0

```

```

> restart
> Sistema := diff(y[1](t), t) = y[2](t), diff(y[2](t), t) = y[3](t), diff(y[3](t), t) = 6·y[1](t)
  + 4·y[2](t) - 2·y[3](t) : Sistema[1]; Sistema[2]; Sistema[3]

```

$$\frac{d}{dt} y_1(t) = y_2(t)$$

$$\frac{d}{dt} y_2(t) = y_3(t)$$

$$\frac{d}{dt} y_3(t) = 6 y_1(t) + 4 y_2(t) - 2 y_3(t) \quad (5)$$

```

> Solucion := dsolve({Sistema}) : evalf(Solucion[1], 2); evalf(Solucion[2], 2);
  evalf(Solucion[3], 2)

```

$$y_1(t) = (-0.79 + 0.0019 I) c_1 e^{(-1.3 - 0.029 I) t} + (-0.39 + 0.040 I) c_2 e^{(-2.7 - 0.020 I) t} + (0.51 - 0.025 I) c_3 e^{(1.9 - 0.0040 I) t}$$

$$y_2(t) = c_1 e^{(-1.3 - 0.029 I) t} + c_2 e^{(-2.7 - 0.020 I) t} + c_3 e^{(1.9 - 0.0040 I) t}$$

$$y_3(t) = -(1.3 + 0.029 I) c_1 e^{(-1.3 - 0.029 I) t} - (2.7 + 0.020 I) c_2 e^{(-2.7 - 0.020 I) t} + (1.9 - 0.0040 I) c_3 e^{(1.9 - 0.0040 I) t} \quad (6)$$

```

> Ecua := diff(y(t), t$3) + 2·diff(y(t), t$2) - 4·diff(y(t), t) - 6·y(t) = 0

```

$$Ecua := \frac{d^3}{dt^3} y(t) + 2 \frac{d^2}{dt^2} y(t) - 4 \frac{d}{dt} y(t) - 6 y(t) = 0 \quad (7)$$

```

> Sol := dsolve(Ecua) : evalf(%, 2)

```

$$y(t) = c_1 e^{(-1.3 - 0.029 I) t} + c_2 e^{(-2.7 - 0.020 I) t} + c_3 e^{(1.9 - 0.0040 I) t} \quad (8)$$

$$\begin{aligned}
 & \text{In []: evalf(Solucion[1], 2)} \\
 & y_1(t) = (-0.79 + 0.0019 I) c_1 e^{(-1.3 - 0.029 I) t} + (-0.39 + 0.040 I) c_2 e^{(-2.7 - 0.020 I) t} + (0.51 \\
 & \quad - 0.025 I) c_3 e^{(1.9 - 0.0040 I) t} \\
 & \text{Out []: }
 \end{aligned}
 \tag{9}$$