```
> restart
> SistEcuaDif := 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) : SistEcuaDif[1]; SistEcuaDif[2]
```

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

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

```
> AA := array([[2, 3], [1, 4]])
```

$$AA := \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix} \quad \textbf{(2)}$$

```
> with(linalg) :
> MatExp := exponential(AA, t)
```

$$MatExp := \begin{bmatrix} \frac{3}{4} e^{t} + \frac{1}{4} e^{5t} & \frac{3}{4} e^{5t} - \frac{3}{4} e^{t} \\ \frac{1}{4} e^{5t} - \frac{1}{4} e^{t} & \frac{1}{4} e^{t} + \frac{3}{4} e^{5t} \end{bmatrix} \quad \textbf{(3)}$$

```
> Fcero := array([_C1, _C2])
```

$$Fcero := \begin{bmatrix} \_C1 & \_C2 \end{bmatrix} \quad \textbf{(4)}$$

```
> SolGral := evalm(MatExp &* Fcero) : x[1](t) = SolGral[1]; x[2](t) = SolGral[2];
```

$$x_1(t) = \left(\frac{3}{4} e^{t} + \frac{1}{4} e^{5t}\right) \_C1 + \left(\frac{3}{4} e^{5t} - \frac{3}{4} e^{t}\right) \_C2$$

$$x_2(t) = \left(\frac{1}{4} e^{5t} - \frac{1}{4} e^{t}\right) \_C1 + \left(\frac{1}{4} e^{t} + \frac{3}{4} e^{5t}\right) \_C2 \quad \textbf{(5)}$$

```
> SistEcuaDif[1]
```

$$\frac{d}{dt} x_1(t) = 2\,x_1(t) + 3\,x_2(t) \quad \textbf{(6)}$$

```
> SistEcuaDif[2]
```

$$\frac{d}{dt} x_2(t) = x_1(t) + 4\,x_2(t) \quad \textbf{(7)}$$

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

$$ComprobarUno := 0 = 0 \quad \textbf{(8)}$$

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

$$ComprobarDos := 0 = 0 \quad \textbf{(9)}$$

```
>
```