```
> restart
> A := array([[1, 2], [3, -4]])
```

$$A := \begin{bmatrix} 1 & 2 \\ 3 & -4 \end{bmatrix} \tag{1}$$

```
> with(linalg) :
> det(A)
```

$$-10 \tag{2}$$

```
> MatExp := exponential(A, t)
```

$$MatExp := \begin{bmatrix} \frac{1}{7}e^{-5t} + \frac{6}{7}e^{2t} & \frac{2}{7}e^{2t} - \frac{2}{7}e^{-5t} \\ \frac{3}{7}e^{2t} - \frac{3}{7}e^{-5t} & \frac{6}{7}e^{-5t} + \frac{1}{7}e^{2t} \end{bmatrix} \tag{3}$$

```
> ComprobacionUno := evalm(map(diff, MatExp, t) - evalm(A &* MatExp))
```

$$ComprobacionUno := \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} \tag{4}$$

```
> ComprobacionDos := map(rcurry(eval, t='0'), MatExp)
```

$$ComprobacionDos := \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \tag{5}$$

```
> InvMatExp := map(rcurry(eval, t='-t'), MatExp)
```

$$InvMatExp := \begin{bmatrix} \frac{1}{7}e^{5t} + \frac{6}{7}e^{-2t} & \frac{2}{7}e^{-2t} - \frac{2}{7}e^{5t} \\ \frac{3}{7}e^{-2t} - \frac{3}{7}e^{5t} & \frac{6}{7}e^{5t} + \frac{1}{7}e^{-2t} \end{bmatrix} \tag{6}$$

```
> evalm(MatExp)
```

$$\begin{bmatrix} \frac{1}{7}e^{-5t} + \frac{6}{7}e^{2t} & \frac{2}{7}e^{2t} - \frac{2}{7}e^{-5t} \\ \frac{3}{7}e^{2t} - \frac{3}{7}e^{-5t} & \frac{6}{7}e^{-5t} + \frac{1}{7}e^{2t} \end{bmatrix} \tag{7}$$

```
> ComprobacionTres := simplify(evalm( MatExp &* InvMatExp))
```

$$ComprobacionTres := \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \tag{8}$$

```
> restart
> with(PDETools)
```

[*CanonicalCoordinates*, *ChangeSymmetry*, *CharacteristicQ*, *CharacteristicQInvariants*, *ConservedCurrentTest*, *ConservedCurrents*, *ConsistencyTest*, *D_Dx*, *DeterminingPDE*, *Eta_k*, *Euler*, *FromJet*, *InfinitesimalGenerator*, *Infinitesimals*, *IntegratingFactorTest*, (9)

IntegratingFactors, *InvariantSolutions*, *InvariantTransformation*, *Invariants*, *Laplace*, *Library*, *PDEplot*, *PolynomialSolutions*, *ReducedForm*, *SimilaritySolutions*, *SimilarityTransformation*, *SymmetrySolutions*, *SymmetryTest*, *SymmetryTransformation*, *TWSolutions*, *ToJet*, *build*, *casesplit*, *charstrip*, *dchange*, *dcoeffs*, *declare*, *diff_table*, *difforder*, *dpolyform*, *dsubs*, *mapde*, *separability*, *splitstrip*, *splitsys*, *undeclare*]

ECUACIONES EN DERIVADAS PARCIALES

> $EDenDP := diff(z(x,y), y\$2) + 5\cdot diff(z(x,y), x, y) + 6\cdot diff(z(x,y), x\$2) = 0$

$$EDenDP := \frac{\partial^2}{\partial y^2} z(x,y) + 5\left(\frac{\partial^2}{\partial y\,\partial x} z(x,y)\right) + 6\left(\frac{\partial^2}{\partial x^2} z(x,y)\right) = 0 \quad \textbf{(10)}$$

> $SolGral := pdsolve(EDenDP)$

$$SolGral := z(x,y) = \_F1(2y - x) + \_F2(3y - x) \quad \textbf{(11)}$$

>

>