

```
[> restart
=> Q := e3x
=> Q := e3x (1)
```

```
> QQ := exp(3 x)
=> QQ := e3x (2)
```

```
> diff(Q, x)
=> 3 e3x ln(e) (3)
```

```
> diff(QQ, x)
=> 3 e3x (4)
```

```
> restart
=> AA := array([ [0, 1, -1], [2, 0, -2], [-1, 1, 0] ])
=> AA := 
$$\begin{bmatrix} 0 & 1 & -1 \\ 2 & 0 & -2 \\ -1 & 1 & 0 \end{bmatrix}$$
 (5)
```

```
> with(linalg) :
=> MatExp := exponential(AA, t)
=> MatExp := 
$$\begin{bmatrix} -2 + \frac{3}{2} e^t + \frac{3}{2} e^{-t} & 1 - e^{-t} & -\frac{3}{2} e^t + 2 - \frac{1}{2} e^{-t} \\ 2 e^t - 2 & 1 & -2 e^t + 2 \\ -2 + \frac{3}{2} e^{-t} + \frac{1}{2} e^t & 1 - e^{-t} & -\frac{1}{2} e^{-t} - \frac{1}{2} e^t + 2 \end{bmatrix}$$
 (6)
```

```
> MMatEExp := array([ [-2, 1, 2], [-2, 1, 2], [-2, 1, 2] ]) + array([ [ [  $\frac{3}{2}$ , 0, - $\frac{3}{2}$  ], [2, 0, -2],
[  $\frac{1}{2}$ , 0, - $\frac{1}{2}$  ] ] ] ) * exp(t) + array([ [ [  $\frac{3}{2}$ , -1, - $\frac{1}{2}$  ], [0, 0, 0], [  $\frac{3}{2}$ , -1, - $\frac{1}{2}$  ] ] ] ) * exp(-t)
=> MMatEExp := 
$$\begin{bmatrix} -2 & 1 & 2 \\ -2 & 1 & 2 \\ -2 & 1 & 2 \end{bmatrix} + \begin{bmatrix} \frac{3}{2} & 0 & -\frac{3}{2} \\ 2 & 0 & -2 \\ \frac{1}{2} & 0 & -\frac{1}{2} \end{bmatrix} e^t + \begin{bmatrix} \frac{3}{2} & -1 & -\frac{1}{2} \\ 0 & 0 & 0 \\ \frac{3}{2} & -1 & -\frac{1}{2} \end{bmatrix} e^{-t}$$
 (7)
```

```
[>
=>
=>
=>
```