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[ > restart;
[ > with(linalg):
Warning, the protected names norm and trace have been redefined and unprotected
[ > A:=matrix([[1,1,4],[0,2,0],[1,1,1]]);

$$A := \begin{bmatrix} 1 & 1 & 4 \\ 0 & 2 & 0 \\ 1 & 1 & 1 \end{bmatrix}$$

[ > X0:=matrix([[1],[3],[0]]);

$$X0 := \begin{bmatrix} 1 \\ 3 \\ 0 \end{bmatrix}$$

[ > eAt:=exponential(A,t);

$$eAt := \begin{bmatrix} \frac{1}{2}e^{(-t)} + \frac{1}{2}e^{(3t)} & \frac{3}{2}e^{(3t)} - \frac{5}{3}e^{(2t)} + \frac{1}{6}e^{(-t)} & e^{(3t)} - e^{(-t)} \\ 0 & e^{(2t)} & 0 \\ -\frac{1}{4}e^{(-t)} + \frac{1}{4}e^{(3t)} & -\frac{1}{12}e^{(-t)} + \frac{3}{4}e^{(3t)} - \frac{2}{3}e^{(2t)} & \frac{1}{2}e^{(-t)} + \frac{1}{2}e^{(3t)} \end{bmatrix}$$

[ > X:=evalm(eAt*X0);

$$X := \begin{bmatrix} e^{(-t)} + 5e^{(3t)} - 5e^{(2t)} \\ 3e^{(2t)} \\ -\frac{1}{2}e^{(-t)} + \frac{5}{2}e^{(3t)} - 2e^{(2t)} \end{bmatrix}$$

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