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[ > restart;
[ > with(linalg):
Warning, the protected names norm and trace have been redefined and unprotected
[ > A:=matrix([[1,-12,-14],[1,2,-3],[1,1,-2]]);

$$A := \begin{bmatrix} 1 & -12 & -14 \\ 1 & 2 & -3 \\ 1 & 1 & -2 \end{bmatrix}$$

[ > X0:=matrix([[4],[6],[-7]]);

$$X0 := \begin{bmatrix} 4 \\ 6 \\ -7 \end{bmatrix}$$

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

$$eAt := \begin{bmatrix} \frac{1}{5} \sin(5t) + \cos(5t) & \frac{25}{13} \cos(5t) - \frac{25}{13} e^t - \frac{131}{65} \sin(5t) & -\frac{207}{65} \sin(5t) - \frac{25}{13} \cos(5t) + \frac{25}{13} e^t \\ \frac{1}{5} \sin(5t) & \frac{7}{13} e^t + \frac{19}{65} \sin(5t) + \frac{6}{13} \cos(5t) & -\frac{32}{65} \sin(5t) + \frac{7}{13} \cos(5t) - \frac{7}{13} e^t \\ \frac{1}{5} \sin(5t) & \frac{19}{65} \sin(5t) + \frac{6}{13} \cos(5t) - \frac{6}{13} e^t & \frac{6}{13} e^t - \frac{32}{65} \sin(5t) + \frac{7}{13} \cos(5t) \end{bmatrix}$$

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

$$X := \begin{bmatrix} 11 \sin(5t) + 29 \cos(5t) - 25 e^t \\ 6 \sin(5t) + 7 e^t - \cos(5t) \\ 6 \sin(5t) - \cos(5t) - 6 e^t \end{bmatrix}$$

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