Maple Project 8

Directions: This project is due in class on Monday, July 19 1999 and will be attached to Quiz 8. Please use the example below to prepare your project. Please prepare your project by modifying the appropriate instructor-provided worksheet.

1. You have seen in class that some real $n \times n$ matrices may have eigenvalues with arbitrary multiplicities but which still have $n$ linearly independent eigenvectors. The following system is such an example. Find a general solution for the system and solve the IVP:

$$\begin{cases}
X'(t) = A X(t) \\
X(0) = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix},
\end{cases}$$

where $A = \begin{bmatrix} 0 & 4 & 4 \\ 4 & 0 & 4 \\ 4 & 4 & 0 \end{bmatrix}$.

2. The following system has a complex root. Find its general solution.

$$X'(t) = \begin{bmatrix} 0 & 4 & 4 \\ -4 & 0 & 1 \\ -4 & -4 & 0 \end{bmatrix} X(t).$$