Maple Project 9

**Directions.** This project is due in class on Thursday, March 30, 2000 and will be attached to Quiz 9. Please prepare your project by modifying the instructor provided templates for fundamental solutions.

1. Let \( A = \begin{bmatrix} 6 & -3 \\ 2 & 1 \end{bmatrix} \). Consider the system initial value problem

\[
\mathbf{x}'(t) = A\mathbf{x}(t), \quad \mathbf{x}(0) = \begin{bmatrix} 2 \\ 0 \end{bmatrix}.
\]

The proposed fundamental matrix of solutions is

\[
\mathbf{X}(t) = \begin{bmatrix} e^{3t} & \frac{3}{2}e^{4t} \\ e^{3t} & e^{4t} \end{bmatrix}.
\]

(a) Verify that \( \mathbf{X}(t) \) is actually a matrix of solutions of the system (1).

(b) Use the Wronskian \( W \) to check linear independence of the proposed fundamental set of solutions.

(c) Use the formula in problem 26 of section 9.4 to solve the initial value problem.

(d) Check your final solution satisfies the equation and initial condition.