Note: Not all quizzes from Fall 97 are here because some were simply written on the board and not word-processed.

Quiz 1

Math 204 H
September 4, 1997

1. (10 pts) Solve the initial value problem

\[ t y' + 2y = t^2 - t + 1, \quad y(1) = \frac{1}{2}, \quad t > 0. \]

2. (10 pts) Solve the differential equation

\[ x y' = (1 - y)^{1/2}. \]

Quiz

Math 204 H
October 23, 1997

(10 pts) Use the Laplace transform to solve the IVP

\[ y'' - y = 1, \quad y(0) = 1, \quad y'(0) = 0 \]
Quiz

All the questions deal with one or more of the following four matrices:

\[ A = \begin{pmatrix} -1 & 2 \\ 0 & 3 \end{pmatrix}, \quad B = \begin{pmatrix} 3 & 4 & 1 \\ 2 & 0 & 1 \end{pmatrix}, \quad C = \begin{pmatrix} 1 & -2 \\ -3 & 4 \\ 5 & -6 \end{pmatrix}, \quad D = \begin{pmatrix} 3 & 0 & 2 \\ 1 & 4 & -2 \\ -1 & 1 & 0 \end{pmatrix} \]

1. (24 pts) For each product, either give the dimensions of the resulting matrix, or say the product does not exist.

- \( AB \) ______
- \( AC \) ______
- \( AD \) ______
- \( BA \) ______
- \( BC \) ______
- \( BD \) ______
- \( CA \) ______
- \( CB \) ______
- \( CD \) ______
- \( DA \) ______
- \( DB \) ______
- \( DC \) ______

2. (16 pts) Find the inverse of \( BC \)

\[ BC = \quad (BC)^{-1} = \]

3. (20 pts) For matrix \( A \), find all eigenvalues and their corresponding eigenvectors.