

## 314 '09-QUIZ 6

Name:-----

May 6, 2009

**1** < 15pts >

Compute  $e^A$  if  $A$  is the matrix

$$A = \begin{bmatrix} -2 & -4 \\ 1 & 3 \end{bmatrix}$$

**Solution**

## **2**   < 15pts >

Solve the initial value problem (you may use the results of problem 1):

$$\begin{aligned}y_1' &= -2y_1 - 4y_2, \quad y_1(0) = 2 \\y_2' &= y_1 + 3y_2, \quad y_2(0) = 1\end{aligned}$$

**Solution**

**3**   < 10pts >

Given the matrices  $A, B$ :

$$A = \begin{bmatrix} -1 & 2 \\ 2 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} -1 & 0 \\ 0 & 2 \end{bmatrix}$$

Is there a nonsingular matrix  $S$  such that

$$S^{-1}AS = B ?$$

If so find it. If not, explain why not.

**Solution**