

# 314 '07-QUIZ 6

Name: \_\_\_\_\_

May 2, 2007

## 1 < 15pts >

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

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

**Solution**

**2**  $< 15pts >$

Solve the initial value problem:

$$\begin{aligned}y'_1 &= -2y_1 - 4y_2, \quad y_1(0) = 2 \\y'_2 &= \quad y_1 + 3y_2, \quad y_2(0) = 1\end{aligned}$$

**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**