Score:	Name:

HW5 - Due 03/05/2008
ODE - spring 2008

1) Prove that if C is a real non-singular n by n materix, then there exists a REAL matrix A such that $e^A = C^2$

2) If ϕ is a solution of $x'' + a(t)x' + b(t)x = 0$ such that ϕ does not vanish on an interval I. Find an independent solution of the interval I.

3) Find the general solution of each of the following systems :

$$\begin{cases} x' = 2x - y \\ y' = 2y \end{cases} \tag{1}$$

$$\begin{cases} x' = 2x - y \\ y' = x + 2y \end{cases} \tag{2}$$

$$\begin{cases} x' = -2x \\ y' = x - 2y \\ z' = y - 2z \end{cases} \tag{3}$$

4) Find the general solution of

$$\begin{cases} x' = -y + t \\ y' = x \end{cases} \tag{4}$$