2E2 Tutorial Sheet 9 Second Term[1]

4 January 2004

1. (3) Find the eigenvectors and eigenvalues of the following matrices

$$(i)\ \begin{pmatrix} 3 & 4 \\ 4 & -3 \end{pmatrix} \qquad (ii)\ \begin{pmatrix} 0 & 3 \\ -3 & 0 \end{pmatrix} \qquad (iii)\ \begin{pmatrix} 1 & 2 \\ 0 & 3 \end{pmatrix} \tag{1}$$

2. (3) Find the solution for the system

$$\begin{aligned} \frac{dy_1}{dt} &= -3y_1 + 2y_2 \\ \frac{dy_2}{dt} &= -2y_1 + 2y_2 \end{aligned}$$

3. (2) Find the general solutions for the system

$$\frac{dy_1}{dt} = 3y_1 + y_2 \tag{2}$$

$$\frac{dy_2}{dt} = y_1 + 3y_2 \tag{3}$$

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