Course 2E02 2013 (SF Engineers & MSISS & MEMS)

S h e e t 7

Due: at the end of the tutorial

Exercise 1

Find the characteristic polynomials of the following matrices:

(ii) $\begin{pmatrix} 0 & 2 \\ -1 & 0 \end{pmatrix}$;

(iii) $\begin{pmatrix} 1 & 2 & -1 \\ 0 & 3 & 2 \\ 0 & 0 & -1 \end{pmatrix}$;

(iv) $\begin{pmatrix} 0 & 2 & -1 \\ 1 & 0 & 2 \\ 0 & -2 & 1 \end{pmatrix}$.

Exercise 2

Find the eigenvalues and corresponding eigenvectors of the following matrices:

(i) $\begin{pmatrix} 3 & 0 \\ -1 & 2 \end{pmatrix}$;

(ii) $\begin{pmatrix} 1 & -1 & -1 \\ 0 & 1 & 3 \\ 0 & -1 & -3 \end{pmatrix}$.

Exercise 3

Find matrix P and diagonal matrix D diagonalizing A, i.e. $P^{-1}AP = D$, where A is as in Exercise 2.