Course 2E1 2006-07 (SF Engineers & MSISS & MEMS)

S h e e t 21

Due: at the end of the tutorial

Exercise 1

Find the least squares approximate solution of the linear system:

(i) $\begin{cases} x = 1 \\ 2x = -1 \end{cases}$;

(ii) $\begin{cases} x + y = 0 \\ x - y = 2 \\ 2x + y = 0 \end{cases}$;

(iii) $\begin{cases} x = 1 \\ y = -1 \\ z = 1 \\ x + y + z = 0 \end{cases}$.

Exercise 2

Find the characteristic polynomials of the following matrices:

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

(ii) $\begin{pmatrix} 0 & 13 \\ -2 & 0 \end{pmatrix}$;

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

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