

Course 2E2 2007-08 (SF Engineers & MSISS & MEMS)**S h e e t 10**

Due: at the end of the tutorial

Exercise 1

Find the least squares approximate solution of the linear system:

$$\begin{aligned} \text{(i)} & \begin{cases} x = 3 \\ 2x = 1 \end{cases}; \\ \text{(ii)} & \begin{cases} x + y = 0 \\ x - y = 1 \\ 2x + y = 0 \end{cases}; \\ \text{(iii)} & \begin{cases} x = 1 \\ y = 1 \\ z = 1 \\ x + y + z = 1 \end{cases}. \end{aligned}$$

Exercise 2

Find the characteristic polynomials of the following matrices:

$$\begin{aligned} \text{(i)} & \begin{pmatrix} -2 & 0 \\ 0 & -1 \end{pmatrix}; \\ \text{(ii)} & \begin{pmatrix} 0 & 2 \\ -9 & 0 \end{pmatrix}; \\ \text{(iii)} & \begin{pmatrix} 1 & 1 & 11 \\ 0 & -3 & 2 \\ 0 & 0 & 0 \end{pmatrix}; \\ \text{(iv)} & \begin{pmatrix} 0 & -1 & 1 \\ 0 & -1 & 2 \\ 0 & 2 & 1 \end{pmatrix}. \end{aligned}$$