

Course 2E01 2015 (SF Engineers & MSISS & MEMS)**S h e e t 8**

Due: at the end of the tutorial

Exercise 1

Find the eigenvalues and corresponding eigenvectors of the following matrix:

$$\begin{pmatrix} -1 & 1 & 1 \\ 0 & 2 & 3 \\ 0 & -4 & -6 \end{pmatrix}.$$

Exercise 2

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

Exercise 3

Find the Fourier series of the function

$$f(x) = \begin{cases} 1 & \text{if } -\pi \leq x < 0 \\ -4 & \text{if } 0 \leq x \leq \pi. \end{cases}$$