

Course 2E01 2016 (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:

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

Exercise 2

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

Exercise 3

Use Exercise 2 to solve the system of ordinary differential equations

$$\begin{pmatrix} y_1' \\ y_2' \\ y_3' \end{pmatrix} = A \begin{pmatrix} y_1 \\ y_2 \\ y_3 \end{pmatrix},$$

where A is as in Exercise 1.