

**Course 2E02 2010 (SF Engineers & MSISS & MEMS)****S h e e t 8**

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Due: at the end of the tutorial

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**Exercise 1**

Find the eigenvalues and corresponding eigenvectors of the following matrices:

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

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

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

**Exercise 2**

Find a matrix  $P$  that diagonalizes each matrix  $A$  in Exercise 2 and determine the corresponding diagonal matrix  $D = P^{-1}AP$ .