

### ENGR122 Assignment 4

Dimitrios Mitsotakis, SMS, Victoria University of Wellington

**DUE: 1pm 17 August 2018**

1. Find the values of  $\lambda$  that make the following determinants zero:

$$\begin{vmatrix} 1 & 3 - \lambda & 4 \\ 4 - \lambda & 2 & -1 \\ 1 & \lambda - 6 & 2 \end{vmatrix}$$

2. Find the inverse of the matrix

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 2 & 3 & 1 \end{pmatrix}$$

3. Solve the system

$$\begin{pmatrix} 1 & 2 & 3 & 1 \\ 2 & 1 & 1 & 1 \\ 1 & 2 & 1 & 0 \\ 0 & 1 & 1 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \\ t \end{pmatrix} = \begin{pmatrix} 5 \\ 3 \\ 4 \\ 0 \end{pmatrix}$$

4. Find the eigenvectors of the matrix

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

5. Given the matrix

$$A = \begin{pmatrix} 1 & 0 & -1 \\ 1 & 0 & 1 \\ 2 & 2 & 2 \end{pmatrix}$$

determine  $|A^2|$  and  $|A + A|$ .

The marks are 20,20,20,20,20 for questions 1-5. Total is 100.