

## Assignment 11

15 questions

x 2 = 10 marks)

1.  $A = \begin{pmatrix} 1 & -2 & 8 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$  Eind  $A^{2301}$

2. Eind a matrix  $P$  that orthogonally diagonalizes  $A$  and determine  $P^{-1}AP$ .

$$A = \begin{pmatrix} 6 & 2\sqrt{3} \\ 2\sqrt{3} & 7 \end{pmatrix}$$

3. Repeat #2 for  $A = \begin{pmatrix} -2 & 0 & -36 \\ 0 & -3 & 0 \\ -36 & 0 & -23 \end{pmatrix}$

4. Eind the characteristic equation for the following matrix and then by inspection determine the dimension of the eigenspace.

$$\begin{pmatrix} 1 & -4 & 2 \\ -4 & 1 & -2 \\ 2 & -2 & -2 \end{pmatrix}$$

5. Repeat #4 for  $\begin{pmatrix} 4 & 4 & 0 & 0 \\ 4 & 4 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$