Norwegian University of Science and Technology
Department of Mathematical Sciences

TMA4205 Numerical Linear Algebra Fall 2015

Exercise set 3

1 Consider the matrix

$$A = \begin{bmatrix} 1 & -6 & 0 \\ 6 & 2 & 3 \\ 0 & 3 & 2 \end{bmatrix}$$

Find a rectangle or a square in the complex plane which contains all the eigenvalues of A without actually computing the eigenvalues.

2 Let P be a projection operator in $\mathbb{C}^2$ with $\ker P$ spanned by $(1,1)^{\mathrm{T}}$ and $\mathrm{ran} P$ spanned by $(2,1)^{\mathrm{T}}$. Is P orthogonal? Find the matrix representation of P.