F17CC Homework 2 : Solutions

1. $A^3 - 3A = \begin{pmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$ [2]

Answer must be 100% to gain 2 marks else 0.

2. $\text{adj}(A) = \begin{pmatrix} -1 & 2 & 1 \\ 0 & -2 & 0 \\ 2 & 0 & 0 \end{pmatrix}$ [3] ← should be 100% correct

Check $\begin{pmatrix} -1 & 2 & 1 \\ 0 & -2 & 0 \\ 2 & 0 & 0 \end{pmatrix} \begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 2 & 2 & 1 \end{pmatrix} = \begin{pmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$ [1]

Can be multiplied together in any order must be an honest check

3. $\chi_A(x) = -x^3 + 3x + 2 = -(1+x)^2(x-2)$

Eigenvalues are -1 (twice), 2 (once)

[1] [1] [1] [1]