

Math115 Test 2: 4th February 2004

1. Find all three eigenvalues and one of the eigenvectors of this matrix, and check your answer.

$$\begin{pmatrix} -11 & -4 & 12 \\ 18 & 3 & -18 \\ -8 & -4 & 9 \end{pmatrix}$$

2. (a) Use row operations to find the determinant of this matrix.

$$\begin{pmatrix} -1 & -2 & -1 & -1 \\ x & 0 & 1 & 0 \\ 2 & y & -2 & 1 \\ 0 & -1 & -2 & 0 \end{pmatrix}$$

- (b) Which value of y guarantees that the matrix is non-singular?

3. Use the adjoint method to find a matrix inverse and hence solve this system of equations:

$$\begin{aligned} x - 3y + 3z &= 1 \\ -x + y - z &= -3 \\ 2x - 2y + 3z &= 8 \end{aligned}$$

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