

Math115 Test 2: Determinants and Inverses

February 3rd, 2010

Answer all part of the question and give complete reasons and checks for your answers. Attach all rough working and do not erase anything that might earn you marks. The parts of the questions are weighted as shown in square brackets on the right.

1. (a) Find the inverse of the matrix A using the adjoint method. [7]

$$A := \begin{pmatrix} -4 & x & 2 \\ 4 & 2 & 4 \\ 5 & 1 & 5 \end{pmatrix}$$

- (b) Explain what the determinant of the matrix C resulting from multiplying row 2 of A by $\frac{1}{2}$ would be and why, and check using a Laplace expansion of C . [3]

2. (a) For what values of w and y is this matrix B guaranteed to be non-singular? [9]

$$B := \begin{pmatrix} 1 & w & 0 & 0 \\ 1 & 0 & y & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{pmatrix}$$

- (b) Find values for w and y which would make $\det(B) = 26$. [1]