

Math1204 Test 2

February 1st, 2012

Answer all questions and give complete reasons and checks for your answers. Please do not erase anything, just put a line through your work and continue; you cannot lose marks for anything you write. The parts of the questions are weighted as shown and can be answered in any order.

1. (a) Find the inverse of this matrix using row operations: [8]

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

- (b) Check your answer by evaluating AA^{-1} . [2]

2. (a) Use cofactor expansions to find the determinant of B . [5]

$$B := \begin{pmatrix} 1 & 3 & 2 & 2 \\ 3 & x & 2 & 1 \\ 2 & -1 & 1 & 0 \\ y & 0 & 0 & 1 \end{pmatrix}$$

- (b) Which value of x guarantees that B is non-singular? [2]

- (c) Find a 3×3 matrix with determinant 4 which has all entries as 0, 1 or -1.
What is the maximum determinant of a 2×2 matrix with entries which have absolute value at most t ? [3]